

March 18, 2003



# Configuration and Options Guide

**IBM@server**  
**xSeries**

**IBM**  
**IntelliStation®**

**ULTRA320**  
SCSI

*Systems and Options*

*External Expansion*

*Rack Cabinets & Options*

*Fibre Channel Solutions*

*Internal/External Cabling*

*System Management H/W*



**@server**

**PROVEN**

## ***Introducing in this issue ...***

- BladeCenter HS20 with 2.8GHz Xeon processor
- IntelliStation Z Pro 6221 models with 3.06GHz Xeon processors
- IntelliStation M Pro 6219 models
- Remote Supervisor Adapter II
- Ultra320 15Krpm HDDs



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# Information Sources

<b>Europe, Middle East and Africa (EMEA)</b>		
<b>Audience</b>	<b>Where to go</b>	<b>How to get</b>
<b>IBM xSeries Configuration and Options Guide, Rack Configurator, Configuration Aid</b>		
Business Partners and IBM Employees	<a href="http://www.pc.ibm.com/europe/configurators">www.pc.ibm.com/europe/configurators</a>	Download or register for E-mail distribution
Feedback	<a href="mailto:psg_configure@uk.ibm.com">psg_configure@uk.ibm.com</a>	E-mail
<b>Canada</b>		
<b>IBM xSeries Configuration and Options Guide</b>		
Customers	<a href="http://www.pc.ibm.com/ca/eserver/xseries/index.shtml">www.pc.ibm.com/ca/eserver/xseries/index.shtml</a>	Select Support then Configuration and Options Guide.
Business Partners	<a href="http://www.pc.ibm.com/partner/ca">www.pc.ibm.com/partner/ca</a>	Select Marketing Essentials then Configurators (user ID and password required).
IBM Employees	Marketing Essentials	Main menu --> Configurators
Feedback	<a href="http://www.pc.ibm.com/partner/ca/feedback.html">www.pc.ibm.com/partner/ca/feedback.html</a>	-
<b>IBM xSeries and Netfinity Rack Configurator</b>		
Customers	<a href="http://www.pc.ibm.com/us/eserver/xseries/library/configtools.html">www.pc.ibm.com/us/eserver/xseries/library/configtools.html</a>	Select Support then Rack Configurator.
Business Partners	<a href="http://www.pc.ibm.com/partner/ca">www.pc.ibm.com/partner/ca</a>	Select Marketing Essentials then Configurators (user ID and password required).
IBM Employees	Marketing Essentials	Main menu --> Configurators
Feedback	<a href="mailto:ibm_netfinity_rack_configurator@vnet.ibm.com">ibm_netfinity_rack_configurator@vnet.ibm.com</a>	E-mail
<b>Latest Product &amp; Technical Information</b>		
Customers	<a href="http://www.pc.ibm.com/ca/eserver/xseries/index.shtml">www.pc.ibm.com/ca/eserver/xseries/index.shtml</a>	-
Business Partners	<a href="http://www.pc.ibm.com/partner/ca">www.pc.ibm.com/partner/ca</a> or call the PSMT	User ID and Password required.
IBM Employees	Marketing Essentials	From main menu or by brand category.
<b>Latin America</b>		
<b>IBM xSeries Configuration and Options Guide</b>		
Customers	<a href="http://www.pc.ibm.com/us/eserver/xseries/library/configtools.html">www.pc.ibm.com/us/eserver/xseries/library/configtools.html</a>	Select Support then Configuration and Options Guide.
Business Partners	Marketing Essentials in ePartner	User ID and Password required. <sup>1</sup>
IBM Employees	Marketing Essentials in Lotus Notes PartnerInfo	From main menu or by brand category.
Feedback	<a href="mailto:laconfig@us.ibm.com">laconfig@us.ibm.com</a>	E-mail
<b>IBM xSeries and Netfinity Rack Configurator</b>		
Customers	<a href="http://www.pc.ibm.com/us/eserver/xseries/library">www.pc.ibm.com/us/eserver/xseries/library</a>	Select Support then Rack Configurator
Business Partners	Marketing Essentials in ePartner	User ID and Password required. <sup>1</sup>
IBM Employees	Marketing Essentials in PartnerInfo	From main menu or by brand category.
Feedback	<a href="mailto:ibm_netfinity_rack_configurator@vnet.ibm.com">ibm_netfinity_rack_configurator@vnet.ibm.com</a>	E-mail
<b>Latest Product &amp; Technical Information</b>		
Customers	<a href="http://www.pc.ibm.com/la">www.pc.ibm.com/la</a>	-
Business Partners	<a href="http://www.pc.ibm.com/la/">www.pc.ibm.com/la/</a> or <a href="http://www.pc.ibm.com/br">www.pc.ibm.com/br</a>	User ID and Password required. <sup>1</sup>
IBM Employees	Marketing Essentials in PartnerInfo	-

1. To request a user ID and password, go to [www.pc.ibm.com/la](http://www.pc.ibm.com/la). Select PC PartnerInfo, then select country. On the country page, select the link for PartnerInfo user ID and password requests.

The information contained in this document has not been submitted to any formal IBM test. The following paragraph does not apply to the United Kingdom or any country where any such provisions are inconsistent with local law:

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The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



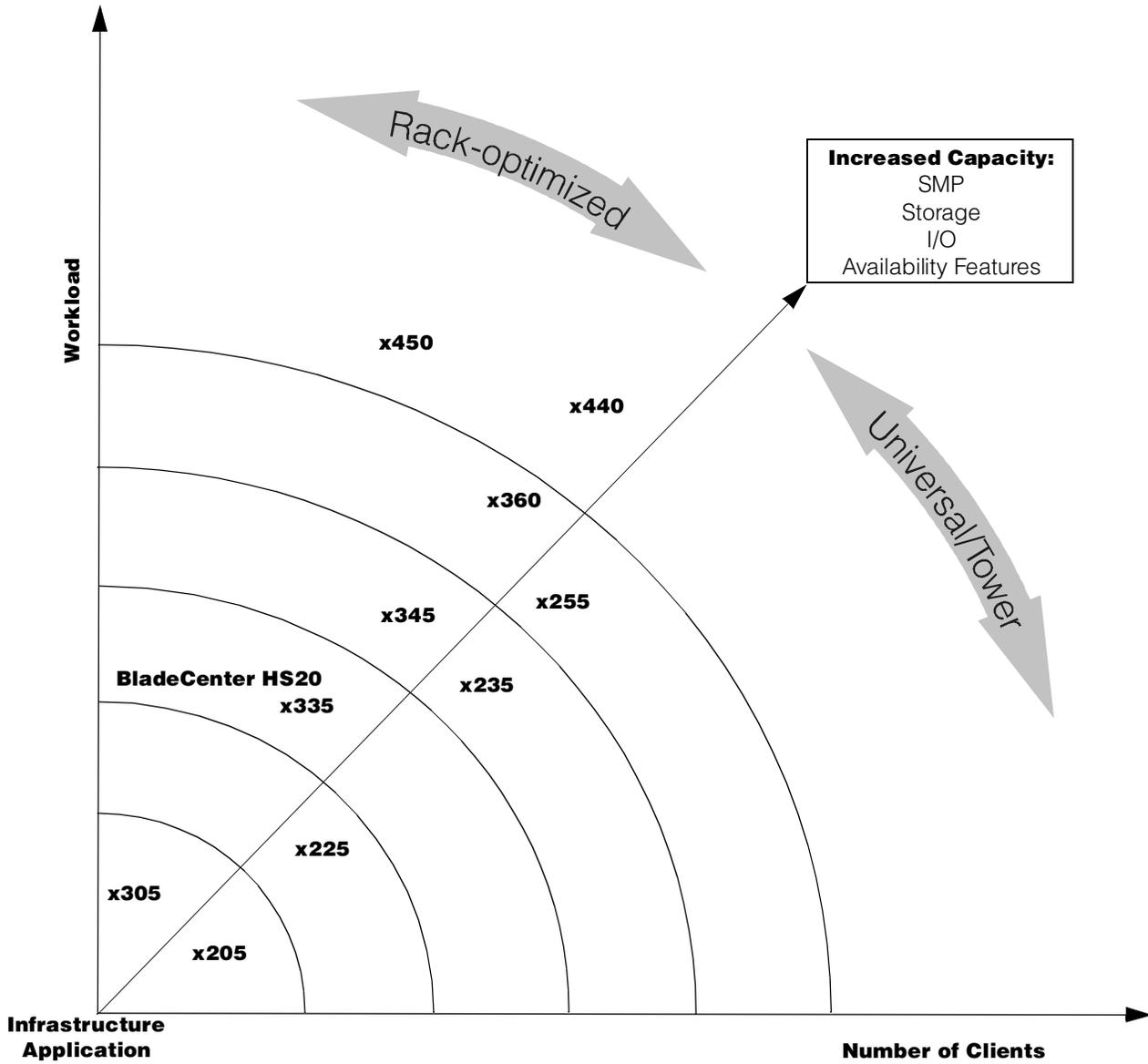
United States		
Audience	Where to go	How to get
<b>IBM xSeries Configuration and Options Guide</b>		
Customers	<a href="http://www.pc.ibm.com/us/eserver/xseries/library/configtools.html">www.pc.ibm.com/us/eserver/xseries/library/configtools.html</a>	Select Configuration and Options Guide.
	<a href="http://www.pc.ibm.com/us/compat">www.pc.ibm.com/us/compat</a>	Select Configuration and Options Guide.
Business Partners	<a href="http://www.pc.ibm.com/partner/us/">www.pc.ibm.com/partner/us/</a>	User ID and Password required.
IBM Employees	PC Marketing Essentials (US) on Lotus Notes database D03DB035\p_dir\pcpartnr\marketng\me4fe-us.nsf	Main menu --> Configuration and Options Guide
	<a href="http://serverproven.raleigh.ibm.com/cog/index.shtml">serverproven.raleigh.ibm.com/cog/index.shtml</a>	internal site
Feedback	<a href="mailto:mipdata@us.ibm.com">mipdata@us.ibm.com</a>	E-mail
<b>IBM xSeries and Netfinity Rack Configurator</b>		
Customers	<a href="http://www.pc.ibm.com/us/eserver/xseries/library/configtools.html">www.pc.ibm.com/us/eserver/xseries/library/configtools.html</a>	Select Configuration Tools.
Business Partners	<a href="http://www.pc.ibm.com/partner/us/">www.pc.ibm.com/partner/us/</a>	Select Sales Tools, then Marketing Essentials, then IBM PC Server--> Rack Configurator. User ID and password required.
IBM Employees	PC Marketing Essentials (US) on Lotus Notes database D03DB035\p_dir\pcpartnr\marketng\me4fe-us.nsf	Main menu --> Configurators
Feedback	<a href="mailto:ibm_netfinity_rack_configurator@vnet.ibm.com">ibm_netfinity_rack_configurator@vnet.ibm.com</a>	E-mail
<b>IBM xSeries Configuration Aid</b>		
Customers, Business Partners, IBM Employees	<a href="http://www.pc.ibm.com/qtechinfo/MIGR-41411.html">www.pc.ibm.com/qtechinfo/MIGR-41411.html</a>	
	<a href="http://www.pc.ibm.com/us/eserver/xseries/library/configtools.html">www.pc.ibm.com/us/eserver/xseries/library/configtools.html</a>	
Feedback	<a href="mailto:psg_configure@uk.ibm.com">psg_configure@uk.ibm.com</a>	E-mail
<b>PC Sales Guide/Configurator and WorkPad Pricer (updated twice per week)</b>		
Business Partners	<a href="http://psg.partner.boulder.ibm.com/partner/tpages.nsf/HTML/United+States.PSGC/\$FILE/pcconfig.html">psg.partner.boulder.ibm.com/partner/tpages.nsf/HTML/United+States.PSGC/\$FILE/pcconfig.html</a>	User ID and password required.
IBM Employees	<a href="http://w3-1.ibm.com/psg/essentials/us/me4fe-us.nsf/\$\$FrameSet?ReadForm">w3-1.ibm.com/psg/essentials/us/me4fe-us.nsf/\$\$FrameSet?ReadForm</a>	Select Configurators.
Feedback	<a href="mailto:BMSHD08@us.ibm.com">BMSHD08@us.ibm.com</a>	E-mail
<b>Latest Product &amp; Technical Information</b>		
Customers	<a href="http://www.pc.ibm.com/us/eserver/xseries">www.pc.ibm.com/us/eserver/xseries</a> or call 1-800-772-2227	
Business Partners	<a href="http://www.pc.ibm.com/partner/us/">www.pc.ibm.com/partner/us/</a> or call 1-800-426-7763	Select Products & Services (user ID and password required).
IBM Employees	PC Marketing Essentials (US) on Lotus Notes database D03DB035\p_dir\pcpartnr\marketng\me4fe-us.nsf	From main menu or by brand category.
<b>Additional URLs</b>		
Audience	Where to go	How to get
Technical spec sheets (PSREF)	<a href="http://www.pc.ibm.com/us/eserver/xseries/library.html">www.pc.ibm.com/us/eserver/xseries/library.html</a>	Select Technical spec sheets (PSREF).
IBM Datacenter Solutions	<a href="http://www.pc.ibm.com/ww/eserver/xseries/windows/datacenter.html">www.pc.ibm.com/ww/eserver/xseries/windows/datacenter.html</a>	
Clustering (US, LA, CAN)	<a href="http://www.pc.ibm.com/ww/eserver/xseries/clustering/index.html">www.pc.ibm.com/ww/eserver/xseries/clustering/index.html</a>	Select appropriate category or server.
Benchmark Results	<a href="http://www.pc.ibm.com/ww/eserver/xseries/benchmarks/">www.pc.ibm.com/ww/eserver/xseries/benchmarks/</a>	Select appropriate category or server.
Options/NOS/Server Compatibility	<a href="http://www.pc.ibm.com/us/compat">www.pc.ibm.com/us/compat</a>	Select appropriate Product Type.
NOS - Hot-Plug/Failover Support	<a href="http://www.pc.ibm.com/us/compat">www.pc.ibm.com/us/compat</a>	Select Active PCI Info.
IBM Storage Products	<a href="http://www.storage.ibm.com">www.storage.ibm.com</a>	Select appropriate category .
Adobe® Acrobat® Reader v5.0	<a href="http://www.adobe.com/products/acrobat/readstep.html">www.adobe.com/products/acrobat/readstep.html</a>	Follow instructions.
Adv Sys Mgmt Adapter Firmware	<a href="http://www.pc.ibm.com/ww/eserver/xseries">www.pc.ibm.com/ww/eserver/xseries</a>	Select Servers, select Intel-based Servers, select Fixes, select Get Fixes, select appropriate category.
Flash BIOS Updates	<a href="http://www.pc.ibm.com/ww/eserver/xseries">www.pc.ibm.com/ww/eserver/xseries</a>	Select Servers, select Intel-based Servers, select Fixes, select Get Fixes, select device drivers by server, select appropriate category.
ServeRAID™ Updates	<a href="http://www.pc.ibm.com/ww/eserver/xseries">www.pc.ibm.com/ww/eserver/xseries</a>	Select Servers, select Intel-based Servers, select Fixes, select Get Fixes, select appropriate category.
VMware	<a href="http://www.pc.ibm.com/ww/eserver/xseries/vmware.html">www.pc.ibm.com/ww/eserver/xseries/vmware.html</a>	-

Information Sources

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# Server Product Positioning





When in a competitive situation, this table suggests the appropriate IBM xSeries server to bid against other vendors' equipment. However, as an IBM business partner, you may determine that customer-specific requirements may make an alternative IBM solution a better choice.

	<b>Value Universal/Tower</b>	<b>Departmental/Mission Critical Universal/Tower</b>	<b>Modular Rack-optimized</b>	<b>Modular Enterprise Scalable Nodes</b>
<b>IA-64</b>			<b>IBM:</b> xSeries 450 <b>Dell:</b> PowerEdge 7150 <b>HP:</b> ProLiant rx5670	
<b>IA-32&gt;4-way</b>				<b>IBM:</b> xSeries 440 (Xeon MP)
<b>4-way</b>		<b>IBM:</b> xSeries 255 <b>Dell:</b> PowerEdge 6600 <b>HP:</b> ProLiant ML570	<b>IBM:</b> xSeries 360 <b>Dell:</b> PowerEdge 6650 <b>HP:</b> ProLiant DL580G2	<b>IBM:</b> xSeries 440 (Xeon) <b>Dell:</b> PowerEdge 6650 <b>HP:</b> ProLiant DL580G2
<b>2-way</b>	<b>IBM:</b> xSeries 225 <b>Dell:</b> PowerEdge 1600SC <b>HP:</b> ProLiant ML350G3	<b>IBM:</b> xSeries 235 <b>Dell:</b> PowerEdge 2500 <b>HP:</b> ProLiant ML370	<b>IBM:</b> xSeries 335, xSeries 345 <b>Dell:</b> PowerEdge 1650, 2650 <b>HP:</b> ProLiant DL360G2, DL380	<b>IBM:</b> BladeCenter HS20
<b>Uni</b>	<b>IBM:</b> xSeries 205 <b>Dell:</b> PowerEdge 500SC <b>HP:</b> ProLiant tc2100		<b>IBM:</b> xSeries 305 <b>Dell:</b> PowerEdge 350 <b>HP:</b> ProLiant DL320	



# IBM xSeries™ Selection Guide

This graph represents general guidelines for selecting the appropriate server based on the number of users that can be supported in a particular application environment. This chart is for general guidance since each customer environment is unique and is unlikely to be precisely represented by any of the specific applications in the chart, but by using the chart, a reasonable approximation can be derived. External Storage Units are utilized when internal capacities are exceeded. Utilize the chart by following the steps outlined at the end of this section. These are not published benchmark results. Access [www.pc.ibm.com/ww/eserver/xseries/benchmarks/index.html](http://www.pc.ibm.com/ww/eserver/xseries/benchmarks/index.html) to obtain the benchmark data.

<b>Application/ Expectation of Maximum # of Users</b>		<b>xSeries 205 2.8GHz/ 533MHz- 512KB Pentium 4</b>	<b>xSeries 225 2.8GHz/ 533MHz- 512KB Dual Xeon DP</b>	<b>xSeries 305 2.67GHz/ 533MHz- 512KB Pentium 4</b>	<b>xSeries 335 Dual 2.8GHz/ 533MHz- 512KB Xeon DP</b>	<b>xSeries 345 2.8GHz/ 533MHz- 512KB Dual Xeon DP</b>	<b>xSeries 235 2.8GHz/ 533MHz- 512KB Dual Xeon DP</b>
<b>DB Transaction Processing</b> Select, Update and Delete; Does not include image or Decision Support	<b># Users</b>	<b>2290</b>	<b>8660</b>	<b>2750</b>	<b>6260</b>	<b>8660</b>	<b>8660</b>
	# Processors	1	2	1	2	2	2
	Memory	2GB	8GB	2 - 4GB	4GB	8GB	8GB
	# Hard Disk Drives	20 to 30	50 to 70	40 to 50	70 to 90	50 to 70	50 to 70
	# RAID Adapters	≥2 or Fibre	≥2	Fibre	Fibre	≥2	≥2
	# Network Connections	1	1Gb	1Gb	1Gb	1Gb	1Gb
<b>File and Print</b> Application is stored locally. (For server stored applications - cut number of users in half).	<b># Users</b>	<b>1540</b>	<b>6050</b>	<b>1980</b>	<b>6160</b>	<b>6050</b>	<b>6050</b>
	# Processors	1	2	1	2	2	2
	Memory	2GB	3 - 4GB	2 - 3GB	3 - 4GB	3 - 4GB	3 - 4GB
	# Hard Disk Drives	10 to 20	50 to 90	14 to 25	50 to 90	50 to 90	50 to 90
	# RAID Adapters	1 or Fibre	≥4	1 or Fibre	2 or Fibre	≥4	≥4
	# 100Mbps Ethernet Connections	1Gb	1Gb	1Gb	1Gb	1Gb	1Gb
<b>Lotus® Notes®</b> 10% Power Users 40% Mail 50% Mail & DB	<b># Users</b>	<b>1760</b>	<b>5060</b>	<b>2750</b>	<b>5060</b>	<b>5060</b>	<b>5060</b>
	# Processors	2	2	2	2	2	2
	Memory	2GB	3GB	2GB	3GB	3GB	3GB
	# Hard Disk Drives	15 to 25	20 to 30	15 to 20	20 to 30	20 to 30	20 to 30
	# RAID Adapters	1 to 2	2 to 3	1	2 or Fibre	2 or Fibre	2 or Fibre
	# Network Connections	≥2	1Gb	1Gb	1Gb	1Gb	1Gb
<b>Microsoft® Exchange Server 2000</b> 100% Med Users 30MB Mailbox	<b># Users</b>	<b>1750</b>	<b>3250</b>	<b>1750</b>	<b>3250</b>	<b>3250</b>	<b>3250</b>
	# Processors	1	2	1	2	2	2
	Memory	1GB	2GB	1GB	2GB	2GB	2GB
	# Hard Disk Drives	12	22	12	22	22	22
	# RAID Adapters	1 4Mx	1 4Mx	1 4Mx	1 4H	1 4H	1 4H
	# Network Connections	1	1	1	1 to 2	1 to 2	1 to 2
<b>SAP 3-Tier Distributed Version 4.0b Processing</b> Sales and Distribution Application (Minimum of 16-20 Servers)	<b># Users</b>	-	-	-	-	-	-
	# Processors	-	-	-	-	-	-
	Memory	-	-	-	-	-	-
	# Hard Disk Drives	-	-	-	-	-	-
	# RAID Adapters	-	-	-	-	-	-
	# Network Connections	-	-	-	-	-	-
<b>SAP Central Version 4.0b Processing</b> Sales and Distribution Application (One Server)	<b># Users</b>	<b>170</b>	<b>180</b>	<b>170</b>	<b>180</b>	<b>180</b>	<b>180</b>
	# Processors	2	2	2	2	2	2
	Memory	2GB	2GB	2GB	2GB	2GB	2GB
	# Hard Disk Drives	12 to 24	12 to 24	12 to 24	12 to 24	12 to 24	12 to 24
	# RAID Adapters	≥1	≥1	≥1	≥1	≥1	≥1
	# Network Connections	1	1	1	1	1	1
<b>High Availability Features</b>	Hot-Swap HDD Bays	X	X	-	X	X	X
	Hot-Plug PCI Slots	-	-	-	-	-	X
	Hot-Swap Power	-	X	-	-	X	X
	Hot-Swap Fans	-	-	-	-	X	X
	RAID	Opt	Opt	Opt	Opt	Opt	Opt
	Integrated HDD Mirroring	-	X	-	X	X	X
	Clustering Support	-	-	-	X	X	X
	Sys Mgt Processor	Opt	Opt	Opt	X	X	X
<b>Other Distinguishing Features</b>	Max # Processors	1	2	1	2	2	2
	Max Memory	2GB	8GB	4GB	4GB	4GB	6GB
	Max Int Storage	293.6GB <sup>2</sup>	880.8GB	146.8GB	203.6GB	880.8GB	1321.2GB
	Max Int Storage with Int Tape Drive	293.6GB	880.8GB	-	-	-	880.8GB
	Available PCI Slots	5	5	1	2	5	6
	19in Rack Models	-	-	X	X	X	-



# IBM xSeries Selection Guide

Application/ Expectation of Maximum # of Users		xSeries 255 2GHz/ 400MHz- 2MB L3 Quad Xeon MP	xSeries 360 2GHz/ 400MHz- 2MB L3 Quad Xeon MP	xSeries 440 2GHz/ 400MHz- 2MB L3 Eight-way Xeon MP	xSeries 450 1GHz/ 400MHz- 3MB Quad Itanium 2	BladeCenter (chassis)	BladeCenter HS20 Dual 2.8GHz/ 400MHz- 512KB Xeon DP
<b>DB Transaction Processing</b> Select, Update and Delete; Does not include image or Decision Support	<b># Users</b>	<b>13200</b>	<b>12800</b>	<b>20000</b>	<b>17020</b>	<b>72380</b>	<b>5170</b>
	# Processors	4	4	8	4	(BladeCenter	2
	Memory	12GB	8GB	32GB	40GB	numbers are	4GB
	# Hard Disk Drives	170 to 220	190 to 240	150 to 200	120 to 170	derived by	70 to 90
	# RAID Adapters	≥5 or Fibre	≥5 or Fibre	≥4 or Fibre	≥4 or Fibre	multiplying by	Fibre
# Network Connections	1Gb	1Gb	1Gb	1Gb	14 HS20s)	1Gb	
<b>File and Print</b> Application is stored locally. (For server stored applications cut number of users in half).	<b># Users</b>	<b>6500</b>	<b>6800</b>	<b>6800</b>	<b>6800</b>	<b>78400</b>	<b>5600</b>
	# Processors	4	4	4	4	(BladeCenter	2
	Memory	4GB	4GB	4GB	6GB	numbers are	3 - 4GB
	# Hard Disk Drives	60 to 120	70 to 130	70 to 130	70 to 130	derived by	50 to 90
	# RAID Adapters	≥4 or Fibre	≥4 or Fibre	≥4 or Fibre	≥4 or Fibre	multiplying by	Fibre
# 100Mbps Ethernet Connections	1Gb	1Gb	4 or 1Gb	1Gb	14 HS20s)	1Gb	
<b>Lotus Notes</b> 10% Power Users 40% Mail 50% Mail & DB	<b># Users</b>	<b>6700</b>	<b>6700</b>	<b>6700</b>	<b>-</b>	<b>64400</b>	<b>4600</b>
	# Processors	4	4	4	-	(BladeCenter	2
	Memory	4GB	4GB	4GB	-	numbers are	3GB
	# Hard Disk Drives	30 to 40	30 to 40	30 to 40	-	derived by	20 to 30
	# RAID Adapters	2 or Fibre	2 or Fibre	2 or Fibre	-	multiplying by	Fibre
# Network Connections	1Gb	1Gb	1Gb	-	14 HS20s)	1Gb	
<b>Microsoft Exchange Server2000</b> 100% Med Users 30MB Mailbox	<b># Users</b>	<b>6000</b>	<b>6000</b>	<b>6000</b>	<b>-</b>	<b>45500</b>	<b>3250</b>
	# Processors	4	4	4	-	(BladeCenter	2
	Memory	4GB	4GB	4GB	-	numbers are	2GB
	# Hard Disk Drives	34	34	34	-	derived by	32
	# RAID Adapters	1 4H	1 4H	1 4H	-	multiplying by	Fibre
# Network Connections	2	2	2	-	14 HS20s)	2	
<b>SAP 3-Tier Distributed Version 4.0b Processing</b> Sales and Distribution Application (Minimum of 16-20 Servers)	<b># Users</b>	<b>4800</b>	<b>4600</b>	<b>6400</b>	<b>-</b>	<b>-</b>	<b>-</b>
	# Processors	4	4	8	-	-	-
	Memory	≥4GB	8GB	≥4GB	-	-	-
	# Hard Disk Drives	48 to 60	48 to 60	48 to 60	-	-	-
	# RAID Adapters	≥3	≥3	≥3	-	-	-
# Network Connections	1	1	1	-	-	-	
<b>SAP Central Version 4.0b Processing</b> Sales and Distribution Application (One Server)	<b># Users</b>	<b>375</b>	<b>345</b>	<b>480</b>	<b>-</b>	<b>-</b>	<b>180</b>
	# Processors	4	4	8	-	-	2
	Memory	≥2GB	8GB	≥4GB	-	-	2GB
	# Hard Disk Drives	24 to 36	24 to 36	24 to 36	-	-	12 to 24
	# RAID Adapters	≥2	≥2	≥2	-	-	Fibre
# Network Connections	1	1	1	-	-	1	
<b>High Availability Features</b>	Hot-Swap HDD Bays	X	X	X	X	-	X
	Hot-Plug PCI Slots	X	X	X	X	-	-
	Hot-Swap Power	X	X	X	X	X	-
	Hot-Swap Fans	X	X	X	X	X	-
	RAID	Opt	Opt	Opt	Opt	-	Opt <sup>3</sup>
	Integrated HDD Mirroring	-	-	-	X	-	X <sup>3</sup>
	Clustering Support	X	X	X	X	X	-
Sys Mgt Processor	X	X	X	X	X	-	
<b>Other Distinguishing Features</b>	Max # Processors	4	4	8	4	28 <sup>4</sup>	2
	Max Memory	12GB	8GB	32GB	40GB	56GB <sup>5</sup>	4GB
	Max Int Storage	1761.6GB	220.2GB	146.8GB	293.6GB	1.588TB <sup>6</sup>	226.8GB
	Max Int Storage with Int Tape Drive	1761.6GB	-	-	-	-	-
	Available PCI Slots	7	6	6	6	-	-
19in Rack Models	X	X	X	X	X	-	



1. MHz/GHz only measure microprocessor internal clock speed, not application performance. Many factors affect application performance.
2. When referring to hard disk drive capacity, GB equals one billion bytes. Total user accessible capacity may vary depending on operating environments.
3. Onboard mirroring, which is equivalent to RAID 10, is supported in BladeCenter HS20 when a SCSI Storage Expansion Unit is installed with two matching SCSI hot-swap HDDs.
4. A maximum of 28 processors are supported when 14 HS20s are installed in the BladeCenter.
5. The maximum of 56GB of memory is based on 4GB in each of 14 HS20s.
6. Maximum storage of 1.588TB is based on seven HS20s with two 40GB IDE HDDs in each and a SCSI Storage Expansion Unit attached to each HS20 containing two 73.4GB Ultra160 SCSI hot-swap HDDs.

#### **Procedure for Server Selection Guidance Chart**

File and Print numbers are Novell Netware-based with all others based on Microsoft Windows NT®. Other Network Operating System (NOS) results could vary. Extensive SAP sizings are available from IBM/SAP Competency Centers. Contact your IBM Marketing Representative for additional information.

**Step 1:** Determine which application (row) most closely represents the customer's environment.

**Step 2:** Move from left to right along the row (chosen in Step 1) noting which columns contain numbers that are equal to or greater than the maximum customer's planned number of users.

**Step 3:** Move up the columns (chosen in Step 2) to the top row to determine which IBM xSeries or Netfinity servers should be considered as possible solutions.

**Step 4:** Evaluate other features such as storage, memory capacity, high availability components, number of available expansion slots, etc., which are unique to each server, in order to determine which is the most appropriate to recommend.

For your reference, configuration information corresponding to the number of users is also provided.



# IntelliStation® Video Adapter Selection Guide

video adapter <sup>1</sup>	imaging	dual-head graphics	memory	signal width	resolution supported (each head)	monitor connector type	# / type monitors supported	system support <sup>2</sup>
3DLabs Wildcat4™ 7110 <sup>3,4</sup>	extreme 3D	Y	128/128MB	128/64-bit	2048 x 1536 (analog), 3820 x 2160 (digital) <sup>5</sup>	2 DVI-I	2 digital, hybrid or analog (any combination)	M Pro 6219, Z Pro 6221
ATI Fire™ GL 8800	advanced 3D	Y	128MB	128-bit	2048 x 1536 (analog), 1600 x 1200 (digital)	1 DVI-I and 1 analog	1 digital/hybrid or 2 analog/hybrid	E Pro 6226
NVIDIA Quadro FX 1000	extreme 3D	Y	128MB	128-bit	2048 x 1536 (analog), 3820 x 2400 (digital) <sup>5</sup>	2 DVI-I	2 digital, hybrid or analog (any combination)	M Pro 6219, Z Pro 6221
NVIDIA Quadro4 980XGL	advanced 3D	Y	128MB	128-bit	2048 x 1536 (analog), 3840 x 2400 (digital) <sup>5</sup>	2 DVI-I	2 digital, hybrid or analog (any combination)	M Pro 6219, Z Pro 6221
NVIDIA Quadro4 580XGL	entry 3D	Y	64MB	128-bit	2048 x 1536 (analog), 1600 x 1200 (digital)	analog (both require pigtails to convert the LFH60)	2 digital/hybrid or 2 analog/hybrid	E Pro 6216, E Pro 6226
NVIDIA Quadro4 280NVS	high-performance 2D	Y	64MB	128-bit	2048 x 1536 (analog), 1280 x 1024 (digital)	analog (both require pigtails to convert the LFH60)	2 digital/hybrid or 2 analog/hybrid	M Pro 6219, Z Pro 6221
NVIDIA Quadro4 200NVS	high-performance 2D	Y	64MB	128-bit	2048 x 1536 (analog), 1280 x 1024 (digital)	analog (both require pigtails to convert the LFH60)	2 digital/hybrid or 2 analog/hybrid	E Pro 6216, E Pro 6226
Matrox Millennium G450 DVI	entry 2D	Y	32MB	64-bit	2048 x 1536 (analog), 1280 x 1024 (digital)	1 DVI-I	1 digital/hybrid or 2 analog/hybrid (requires pigtail shipped with adapter)	E Pro 6216, E Pro 6226

1. Available only as standard equipment in an IntelliStation workstation model.
2. See IntelliStation system At-A-Glance sections to identify models that include these standard video adapters.
3. Requires more space than the planar provides between slots, preventing the installation of an optional PCI adapter in the first PCI slot.
4. Models shipped with this video adapter do not support video playback in DVD devices.
5. The IBM T221 monitor (P/N 9503DG3) is required to run this mode. Smaller resolutions are available on the digital port with other monitors.

Part Number	Monitor Description	Type	Application
9503DG3	T221 Flat Panel Color Monitor 22.2in (564mm, 22.2in viewable image), stealth black	digital	Very high precision 9.2 million pixel monitor. Best suited for 3820x2160 to 3820x2400 digital resolution.
9494HBN	T860 Hybrid Flat Panel Color Monitor 18.1in (460mm, 18.1in viewable image), stealth black, w/o stand	hybrid	Supports up to 1280x1024 analog/digital.
9494HB0	T860 Hybrid Flat Panel Color Monitor 18.1in (460mm, 18.1in viewable image), stealth black	hybrid	Supports up to 1280x1024 analog/digital.
6657HG2	T750 Hybrid Flat Panel Color Monitor 17in (433mm, 17in viewable image), stealth black	hybrid	Supports up to 1280x1024 analog/digital.
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black	analog	Supports up to 1280x1024 analog.
6656HG2	T560 Hybrid Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black	hybrid	Supports up to 1024x768 analog/digital.
6652U3N	P275 Color Monitor 21in (503mm, 19.8in viewable image), stealth black	analog	Supports up to 2048x1536 @ 75Hz analog.
6651U3N	P97 Color Monitor 19in (457.3mm, 18in viewable image), stealth black	analog	Supports up to 1600x1200 @ 85Hz analog.
6639U3N	P77 Color Monitor 17in (406mm, 16in viewable image), stealth black	analog	Supports up to 1600x1200 @ 75Hz analog.
66274AN	G78 Color Monitor 17in (406.4mm, 16in viewable image), stealth black	analog	Supports up to 1600x1200 @ 65Hz analog.

EMEA Part Number Cross Reference

IntelliStation E Pro 6216 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
KAU20xx	621620U	6216-20G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	31 Mar 03
KAU22xx	621622U	6216-22G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	31 Mar 03
KAU23xx	621623U	6216-23G	P4 2.0GHz/400MHz, 512KB, 256MB, 18.2GB SCSI, NVIDIA Quadro4 200NVS, Windows XP, Desktop	2 Jan 03
KAU30xx	N/A	6216-30G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KAU32xx	N/A	6216-32G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	---
KAU40xx	621640U	6216-40G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	31 Mar 03
KAU42xx	621642U	6216-42G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	---
KAU50xx	621650U	6216-50G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	2 Jan 03
KAU52xx	621652U	6216-52G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	31 Mar 03
KAU54xx	621654U	6216-54G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
KAU55xx	621655U	6216-55G	P4 2.67GHz/533MHz, 512KB, 256MB, 18.2GB SCSI, NVIDIA Quadro4 580XGL, Windows XP, Desktop	2 Jan 03
N/A	621660U	---	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
N/A	621663U	---	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KAU64xx	621664U	6216-64G	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
N/A	621665U	---	P4 2.8GHz/533MHz, 512KB, 256MB, 18.2GB SCSI, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
KAUB0xx	N/A	6216-B0G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	31 Mar 03
KAUB2xx	N/A	6216-B2G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	31 Mar 03
KAUB3xx	N/A	6216-B3G	P4 2.0GHz/400MHz, 512KB, 256MB, 18.2GB SCSI, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	2 Jan 03
KAUC0xx	N/A	6216-C0G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KAUC2xx	N/A	6216-C2G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	---
KAUD0xx	N/A	6216-D0G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	31 Mar 03
KAUD2xx	N/A	6216-D2G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	---
KAUE0xx	N/A	6216-E0G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	2 Jan 03
KAUE2xx	N/A	6216-E2G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	31 Mar 03
KAUE4xx	N/A	6216-E4G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	---
KAUE5xx	N/A	6216-E5G	P4 2.67GHz/533MHz, 512KB, 256MB, 18.2GB SCSI, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	2 Jan 03
KAUF4xx	N/A	6216-F4G	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	---

IntelliStation E Pro 6216 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	19K4162	---	V90 PCI Data/Fax WinModem (Low Profile Enabled)	N/A



# IntelliStation E Pro 6216

## EMEA Part Number Cross Reference

IntelliStation E Pro 6216 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
SUP072Y	94G3134	---	APC Smart-UPS 700	---
SUP102Y	94G3135	---	APC Smart-UPS 1000	---

IntelliStation E Pro 6216 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 1	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 1	T52U3xx	6652U3N	6652-U3N	P275 21" (19.8" viewable image) Colour Monitor (S/Black)	---
Note 1	T39U3xx	6639U3N	6639-U3N	P77 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 1	T1U3Nxx	6651U3N	6651-U3N	P97 19" (18" viewable image) Colour Monitor (S/Black)	---
Note 1	T51U3xx	655163N	6551-63N	P96 19" (17.9" viewable image) Colour Monitor (S/Black)	30/07/02
Note 1	T56HGxx	6656HG2	6656-HG2	T560 15" Flat Panel Colour Monitor (S/Black)	---
Note 1	T75HGxx	6657HG0	6657-HG0	T750 17" Hybrid Flat Panel Color Monitor (S/Black)	---
Note 1	T4HB0xx	9494HB0	9494-HB0	T860 18.1" Hybrid Flat Panel Color Monitor (S/Black)	---
Note 1	T12ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---

1. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

IntelliStation E Pro 6216 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 2	22P5xxx	22P5185	---	IBM Rapid Access III USB Keyboard with HUB	---
Note 3	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
Note 4	28L36xx	28L3644	---	Spacesaver II Keyboard	---

2. Where 'xxx' represents a specific country code as follows: 189=Belgian/English, 190=Danish, 191=Dutch, 192=French, 193=German, 194=Greek, 195=Icelandic, 196=Italian, 197=Norwegian, 198=Spanish, 199=Swedish/Finnish, 200=Swiss, 201=UK English, 202=US International, 205=Arabic, P/N 31P8769=Czech/US.

3. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

4. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.



# IntelliStation E Pro 6216

Part Number 1  
 Processor Speed (GHz)  
 Number of Processors (Std/Max)  
 L2 ECC Cache  
 Memory (Std/Max)  
 Video Adapter  
 Form Factor  
 Onboard Ethernet (Mbps)  
 SCSI Controller (Dual, Ultra, RAID)<sup>4</sup>  
 Removable Media Bays (Total/Avail)  
 Internal Hard Disk Drive (Std/Max)<sup>5</sup>  
 CD-ROM (IDE)<sup>7</sup>  
 Bays (Total/Avail)  
 Slots (Total/Avail)

IntelliStation E Pro 6216 At-A-Glance													
6216-20U	2 <sup>2</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-22U	2 <sup>2</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-23U	2 <sup>2</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Low-profile Desktop	10/100/1000	U160	2/0	18.2GB/146.8GB <sup>6</sup>	48x-20x	3/0	3/2
6216-40U	2.4 <sup>3</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-42U	2.4 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-50U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-52U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-54U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-55U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Low-profile Desktop	10/100/1000	U160	2/0	18.2GB/146.8GB <sup>6</sup>	48x-20x	3/0	3/2
6216-60U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-63U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 280NVS	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-64U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Low-profile Desktop	10/100/1000	IDE	2/0	40GB/120GB	48x-20x	3/0	3/3
6216-65U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Low-profile Desktop	10/100/1000	U160	2/0	18.2GB/146.8GB <sup>6</sup>	48x-20x	3/0	3/2

- IntelliStation E Pro ships with a keyboard and mouse. See "Power, Monitors and Accessories" for a list of compatible monitors.
- Intel Pentium 4 processor with advanced transfer ECC L2 cache, 400MHz (quad-pumped) Front-side Bus (FSB) and MMX technology.
- Intel Pentium 4 processor with advanced transfer ECC L2 cache, 533MHz (quad-pumped) FSB and MMX technology.
- All models include an integrated ATA-100 IDE controller that supports both the IDE CD-ROM and the IDE HDD for IDE models. SCSI models include a single-channel Ultra160 SCSI PCI controller with one internal and one external port (each with high-density 68-pin connectors) installed in slot three. A one-drop, terminated 16-bit LVD internal SCSI cable is included with SCSI models, which supports the single SCSI HDD. IDE models include two one-drop ATA-100 IDE cables.
- Maximum internal storage capacity requires replacement of the standard 18.2GB 10,000rpm nonhot-swap HDD with a 146.8GB nonhot-swap HDD in SCSI models and replacement of the standard 40GB IDE HDD with an 120GB IDE HDD in IDE models.
- Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.
- Variable read rate. Actual playback speed will vary and is often less than the maximum possible.



## IntelliStation E Pro 6216 Memory

Part Number	Memory Description <sup>1</sup>
10K0067	256MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0069	512MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0071	1GB PC2100 CL2.5 ECC DDR SDRAM UDIMM

1. Memory UDIMMs of different densities can be mixed in the two memory sockets.

Total Memory <sup>1</sup>	Quantity of UDIMMs Added <sup>2</sup>		
	256MB std (10K0067)	512MB (10K0069)	1GB (10K0071)
512MB	1	-	-
768MB	-	1	-
1024MB <sup>3</sup>	-	2	-
1280MB	-	-	1
1536MB <sup>3</sup>	-	1	1
2GB <sup>3</sup>	-	-	2

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller UDIMMs may provide a more cost-effective alternative to using larger UDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Select the total memory in the Total Memory column, then install the DIMMs in that row.
3. Requires replacing the standard UDIMM.

## IntelliStation E Pro 6216 Hard Disk Drive (HDD) Storage

SCSI Models				
Total Int Storage <sup>1</sup>	10,000rpm HDDs			
	18.2GB (06P5750)	36.4GB (06P5751, 32P0723) <sup>3</sup>	73.4GB (06P5752, 32P0724) <sup>3</sup>	146.8GB (32P0725) <sup>3</sup>
18.2GB	(Standard on SCSI models)			
36.4GB <sup>2</sup>	-	1	-	-
73.4GB <sup>2</sup>	-	-	1	-
146.8GB <sup>2</sup>	-	-	-	1

1. Select a total storage row then replace the standard HDD with the HDD from the appropriate column.
2. Requires replacement of the standard HDD.
3. Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.

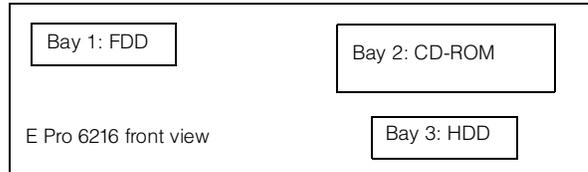
EIDE Models				
Total Internal Storage <sup>1</sup>	7200rpm EIDE HDDs <sup>2</sup>			
	40GB (22P7157)	60GB (09N4207)	80GB (09N4226)	120GB (09N4231)
40GB	Standard on EIDE models			
60GB <sup>2</sup>	-	1	-	-
80GB <sup>2</sup>	-	-	1	-
120GB <sup>2</sup>	-	-	-	1

1. Select a total storage row then replace the standard HDD with the HDD from the appropriate column.
2. Requires replacing the standard HDD.

IntelliStation E Pro 6216



Bay	Form Factor	Height	Front Access	Usage
1	89mm (3.5in)	SL	yes	FDD
2	133mm (5.25in)	HH	yes	optical
3	89mm (3.5in)	SL	no	HDD



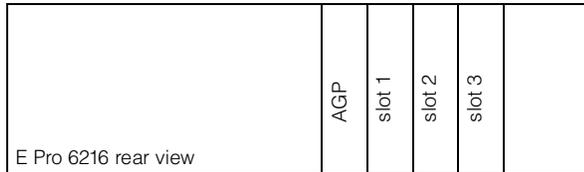
Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
<b>IDE HDDs<sup>1</sup></b>					
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	3	1
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	3	1
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	3	1
09N4231	120GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	3	1
<b>Nonhot-swap Ultra160 SCSI HDDs<sup>2</sup></b>					
06P5750	18.2GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	3	1
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	3	1
06P5752	73.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	3	1
<b>Nonhot-swap Ultra320 HDDs<sup>2,3</sup></b>					
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	3	1
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	3	1
32P0725	146.8GB 10Krpm Ultra320 SCSI HDD	10000	SL	3	1
<b>Removable Media Devices</b>			<b>Bays Supported</b>		
10K3782	48x-20x IDE CD-ROM <sup>4</sup>				2
22P6950	16x Max RAM-Read DVD-ROM Drive <sup>5</sup>				2

1. IDE models support a maximum of two IDE devices (CD-ROM drive and IDE hard disk drive).
2. SCSI models support one SCSI HDD and one IDE CD-ROM.
3. Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.
4. Standard CD-ROM.
5. Requires removing the standard CD-ROM and installing in bay two.

**IntelliStation E Pro 6216 I/O Options**

Part Number	Description	Adapter Length	PCI Support	Slots Supported <sup>1</sup>
<b>Storage Controllers<sup>2</sup></b>				
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>3</sup>	Half	32-bit	1 ... 3
<b>Networking<sup>4</sup></b>				
<b>Ethernet<sup>5</sup></b>				
22P4701	Intel Pro/100S Low Profile Desktop Adapter	Half	32-bit	1 ... 3
22P6601	Intel Pro/1000 Low Profile Desktop Adapter	Half	32-bit	1 ... 3
<b>Token Ring</b>				
07P2701	16/4 Token-ring Low Profile PCI Management Adapter	Half	32-bit	1 ... 3
<b>Communications<sup>6</sup></b>				
19K4162	V90 PCI Data/Fax WinModem (Low Profile Enabled)	Half	32-bit	1 ... 3

1. IntelliStation E Pro 6216 has three half-length PCI expansion slots on a single 32-bit, 33MHz bus.  
 2. IntelliStation E Pro 6216 includes an integrated dual channel ATA-100 IDE controller. SCSI models include a single-channel Ultra160 SCSI PCI controller with one internal and one external port (each with high-density 68-pin connectors) installed in slot three.  
 3. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized. The option ships with both full-size and low-profile brackets.  
 4. Wake on LAN® is supported through PCI networking adapters that provide this function.  
 5. The integrated 10/100/1000 Broadcom-based Ethernet controller supports Wake on LAN.  
 6. E Pro 6216 includes four USB ports (two each on front and rear of chassis), two 9-pin serial ports, one 25-pin parallel port, AC 97 audio line in/out jacks, and a microphone in jack.



- PCI slots 1, 2 and 3 are 32-bit, 33MHz on a single PCI bus.
- All slots are low-profile and support 5v or universal adapters.
- Standard video adapter is installed in the AGP slot.

IntelliStation E Pro 6216

**IntelliStation E Pro 6216 Power , Monitors & Accessories**

Part Number	Description
<b>Power</b>	
	IntelliStation E Pro 6216 includes a 160w voltage-sensing power supply and a single line cord.
<b>Uninterruptible Power Supply (UPS)</b>	
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
<b>Monitors<sup>1</sup></b>	
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black
6657HG2	T750 Hybrid Flat Panel Color Monitor 17in (433mm, 17in viewable image), stealth black
6652U3N	P275 Color Monitor 21in (503mm, 19.8in viewable image), stealth black
6639U3N	P77 Color Monitor 17in (406mm, 16in viewable image), stealth black
6651U3N	P97 Color Monitor 19in (457.3mm, 18in viewable image), stealth black
655163N	P96 Color Monitor 19in (454mm, 17.9in viewable image), stealth black
6656HG2	T560 Hybrid Flat Panel Monitor 15in (381mm, 15in viewable image), stealth black
9494HBO	T860 Hybrid Flat Panel Monitor 18.1in (460mm, 18.1in viewable image), stealth black,
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black
<b>Keyboard and Mouse<sup>2</sup></b>	
22P5185	Rapid Access III USB Keyboard, stealth black
22P5150	TrackPoint USB Space Saver Keyboard
28L3644	Space Saver II Keyboard
33L3252	SpaceBall 3D Input Device

1. Refer to IntelliStation Video Adapter Selection Guide for information regarding video adapter connections.  
 2. IntelliStation E Pro 6216 ships standard with a keyboard and mouse.



## IntelliStation E Pro 6226

### EMEA Part Number Cross Reference

IntelliStation E Pro 6226 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
KBU20xx	622620U	6226-20G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	31 Mar 03
KBU22xx	622622U	6226-22G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	31 Mar 03
KBU30xx	N/A	6226-30G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KBU32xx	N/A	6226-32G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	---
KBU35xx	N/A	6226-35G	P4 2.26GHz/533MHz, 512KB, 256MB, 18.2GB U160, ATI Fire GL8800, Windows XP, Desktop	---
KBU40xx	622640U	6226-40G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KBU42xx	622642U	6226-42G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	31 Mar 03
KBU45xx	622645U	6226-45G	P4 2.4GHz/533MHz, 512KB, 256MB, 18.2GB U160, ATI Fire GL8800, Windows XP, Desktop	2 Jan 03
KBU50xx	622650U	6226-50G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	2 Jan 03
KBU52xx	622652U	6226-52G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, Windows XP, Desktop	---
KBU54xx	622654U	6226-54G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, Windows XP, Desktop	31 Mar 03
KBU55xx	622655U	6226-55G	P4 2.67GHz/533MHz, 512KB, 256MB, 18.2GB U160, NVIDIA Quadro4 580XGL, Windows XP, Desktop	2 Jan 03
N/A	622660U	---	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
N/A	622663U	---	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KBU64xx	622664U	6226-64G	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
N/A	622665U	---	P4 2.8GHz/533MHz, 512KB, 256MB, 18.2GB SCSI, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
KBUB0xx	N/A	6226-B0G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	31 Mar 03
KBUB2xx	N/A	6226-B2G	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	31 Mar 03
KBUC0xx	N/A	6226-C0G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KBUC2xx	N/A	6226-C2G	P4 2.26GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	---
KBUC5xx	N/A	6226-C5G	P4 2.26GHz/533MHz, 512KB, 256MB, 18.2GB U160, ATI Fire GL8800, DOS 2000 Lic., Desktop	---
KBUD0xx	N/A	6226-D0G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KBUD2xx	N/A	6226-D2G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	31 Mar 03
KBUD5xx	N/A	6226-D5G	P4 2.4GHz/533MHz, 512KB, 256MB, 18.2GB U160, ATI Fire GL8800, DOS 2000 Lic., Desktop	2 Jan 03
KBUE0xx	N/A	6226-E0G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	2 Jan 03
KBUE2xx	N/A	6226-E2G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 200NVS, DOS 2000 Lic., Desktop	---
KBUE4xx	N/A	6226-E4G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	31 Mar 03
KBUE5xx	N/A	6226-E5G	P4 2.67GHz/533MHz, 512KB, 256MB, 18.2GB U160, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	2 Jan 03
KBUF4xx	N/A	6226-F4G	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	---

# IntelliStation E Pro 6226

## EMEA Part Number Cross Reference

IntelliStation E Pro 6226 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	19K4162	---	V90 PCI Data/Fax WinModem (Low Profile Enabled)	N/A

IntelliStation E Pro 6226 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
SUP072Y	94G3134	---	APC Smart-UPS 700	---
SUP102Y	94G3135	---	APC Smart-UPS 1000	---

IntelliStation E Pro 6226 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 1	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 1	T52U3xx	6652U3N	6652-U3N	P275 21" (19.8" viewable image) Colour Monitor (S/Black)	---
Note 1	T39U3xx	6639U3N	6639-U3N	P77 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 1	T1U3Nxx	6651U3N	6651-U3N	P97 19" (18" viewable image) Colour Monitor (S/Black)	---
Note 1	T51U3xx	655163N	6551-63N	P96 19" (17.9" viewable image) Colour Monitor (S/Black)	30/07/02
Note 1	T56HGxx	6656HG2	6656-HG2	T560 15" Flat Panel Colour Monitor (S/Black)	---
Note 1	T75HGxx	6657HG0	6657-HG0	T750 17" Hybrid Flat Panel Color Monitor (S/Black)	---
Note 1	T4HB0xx	9494HB0	9494-HB0	T860 18.1" Hybrid Flat Panel Color Monitor (S/Black)	---
Note 1	T12ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---

1. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

IntelliStation E Pro 6226 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 2	22P5xxx	22P5185	---	IBM Rapid Access III USB Keyboard with HUB	---
Note 3	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
Note 4	28L36xx	28L3644	---	Spacesaver II Keyboard	---

2. Where 'xxx' represents a specific country code as follows: 189=Belgian/English, 190=Danish, 191=Dutch, 192=French, 193=German, 194=Greek, 195=Icelandic, 196=Italian, 197=Norwegian, 198=Spanish, 199=Swedish/Finnish, 200=Swiss, 201=UK English, 202=US International, 205=Arabic, P/N 31P8769=Czech/US.

3. Where 'xx' represents a specific country code as follows:- 53=Danish, 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

4. Where 'xx' represents a specific country code as follows:- 46=Danish, 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portuguese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.



# IntelliStation E Pro 6226

Part Number <sup>1</sup>	Processor Speed (GHz)	Number of Processors (Std/Max)	L2 ECC Cache	Memory (Std/Max)	Video Adapter	Form Factor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID) <sup>4</sup>	Removable Media Bays (Total/Avail) <sup>4</sup>	Internal Hard Disk Drive (Total/Avail)	CD-ROM (IDE) <sup>7</sup>	Bays (Total/Avail)	Slots (Total/Avail)
<b>IntelliStation E Pro 6226 At-A-Glance</b>													
6226-20U	2 <sup>2</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-22U	2 <sup>2</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-40U	2.4 <sup>3</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-42U	2.4 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-45U	2.4 <sup>2</sup>	1/1	512KB	256MB/2GB	ATI Fire GL8800	Desktop	10/100/1000	U160	3/1	18.2GB/146.8GB <sup>6</sup>	48x-20x	4/1	3/2
6226-50U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-52U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 200NVS	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-54U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-55U	2.67 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Desktop	10/100/1000	U160	3/1	18.2GB/146.8GB <sup>6</sup>	48x-20x	4/1	3/2
6226-60U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	Matrox Millennium G450 DVI	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-63U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 280NVS	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-64U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Desktop	10/100/1000	IDE	3/1	40GB/120GB	48x-20x	4/1	3/3
6226-65U	2.8 <sup>3</sup>	1/1	512KB	256MB/2GB	NVIDIA Quadro4 580XGL	Desktop	10/100/1000	U160	3/1	18.2GB/146.8GB <sup>6</sup>	48x-20x	4/1	3/2

1. IntelliStation E Pro ships with a keyboard and mouse. See "Power, Monitors and Accessories" for a list of compatible monitors.  
 2. Intel Pentium 4 processor with advanced transfer ECC L2 cache, 400MHz (quad-pumped) Front Side Bus (FSB) and MMX technology.  
 3. Intel Pentium 4 processor with advanced transfer ECC L2 cache, 533MHz (quad-pumped) FSB and MMX technology.  
 4. All models include an integrated ATA-100 IDE controller that supports both the IDE CD-ROM and the IDE HDD for IDE models. SCSI models include a single-channel Ultra160 SCSI PCI controller with one internal and one external port (each with high-density 68-pin connectors) installed in slot three. A three-drop, terminated 16-bit LVD internal SCSI cable is included with SCSI models, which supports up to two SCSI HDDs. IDE models include two two-drop ATA-100 IDE cables.  
 5. Maximum internal storage capacity in SCSI models requires removing the standard 18.2GB 10,000rpm nonhot-swap HDD and installing one 146.8GB nonhot-swap HDD. In IDE models, maximum capacity is achieved by removing the standard 40GB IDE HDD and installing one 120GB IDE HDD.  
 6. Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.  
 7. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.



## IntelliStation E Pro 6226 Memory

Part Number	Memory Description <sup>1</sup>
10K0067	256MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0069	512MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0071	1GB PC2100 CL2.5 ECC DDR SDRAM UDIMM

1. Memory UDIMMs of different densities can be mixed in the two memory sockets.

Total Memory <sup>1</sup>	Quantity of UDIMMs Added		
	256MB std (10K0067)	512MB (10K0069)	1GB (10K0071)
512MB	1	-	-
768MB	-	1	-
1GB <sup>3</sup>	-	2	-
1.25GB	-	-	1
1.5GB <sup>3</sup>	-	1	1
2GB <sup>3</sup>	-	-	2

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller UDIMMs may provide a more cost-effective alternative to using larger UDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Select the total memory in the Total Memory column, then install the UDIMMs in that row.
3. Requires replacing the standard UDIMM.

## IntelliStation E Pro 6226 Hard Disk Drive (HDD) Storage

SCSI Models						
Total Int Storage <sup>1</sup>	10,000rpm HDDs				15,000rpm HDDs	
	18.2GB (06P5750)	36.4GB (06P5751, 32P0723) <sup>3</sup>	73.4GB (06P5752, 32P0724) <sup>3</sup>	146.8GB (32P0725) <sup>3</sup>	18.2GB (06P5765)	36.4GB (06P5766)
18.2GB	(Standard on SCSI models)					
36.4GB <sup>2</sup>	-	1	-	-	-	1
73.4GB <sup>2</sup>	-	-	1	-	-	-
146.8GB <sup>2</sup>	-	-	-	1	-	-

1. Select a total storage row then replace the standard HDD with the HDD from the appropriate column.
2. Requires replacement of the standard HDD.
3. Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.

EIDE Models				
Total Internal Storage <sup>1</sup>	7200rpm EIDE HDDs <sup>2</sup>			
	40GB (22P7157)	60GB (09N4207)	80GB (09N4226)	120GB (09N4231)
40GB	(Standard on EIDE models)			
60GB <sup>2</sup>	-	1	-	-
80GB <sup>2</sup>	-	-	1	-
120GB <sup>2</sup>	-	-	-	1

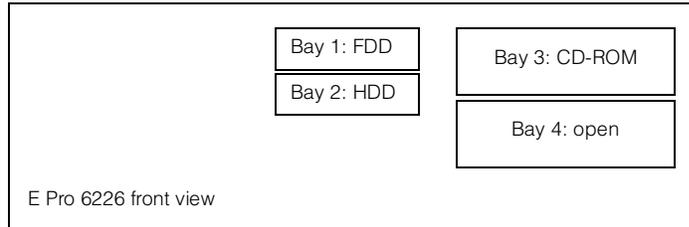
1. Select a total storage row then replace the standard HDD with the HDD from the appropriate column.
2. Requires replacing the standard HDD.

IntelliStation E Pro 6226



Bay	Form Factor	Height	Front Access	Usage
1	89mm (3.5in)	SL	yes	FDD
2	89mm (3.5in)	SL	no	HDD
3	133mm (5.25in)	HH	yes	optical
4	133mm (5.25in)	HH	yes	open <sup>1</sup>

1. An optional optical drive or IDE tape drive can be installed in bay four.



Part Number	Description	RPM	Height	Bays Supported	Max Qty Supported
<b>IDE HDDs<sup>1</sup></b>					
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	2	1
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	2	1
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	2	1
09N4231	120GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	2	1
<b>Nonhot-swap Ultra160 HDDs<sup>2</sup></b>					
06P5750	18.2GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	2	1
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	2	1
06P5752	73.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	2	1
06P5765	18.2GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	2	1
06P5766	36.4GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	2	1
<b>Nonhot-swap Ultra320 HDDs<sup>2, 3</sup></b>					
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	2	1
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	2	1
32P0725	146.8GB 10Krpm Ultra320 SCSI HDD	10000	SL	2	1
<b>Removable Media Devices</b>			<b>Bays Supported</b>		
10K3782	48x-20x IDE CD-ROM <sup>4</sup>				3, 4
22P6950	16x Max RAM-Read DVD-ROMdrive <sup>5</sup>				3, 4
00N8078	250MB IDE Internal Zip Drive <sup>6</sup>				4

1. IDE models support a maximum of three IDE devices including two IDE optical drives and an IDE hard disk drive.

2. SCSI models support one SCSI HDD and two IDE optical drives (or one IDE optical drive and an IDE tape drive).

3. Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.

4. Standard CD-ROM.

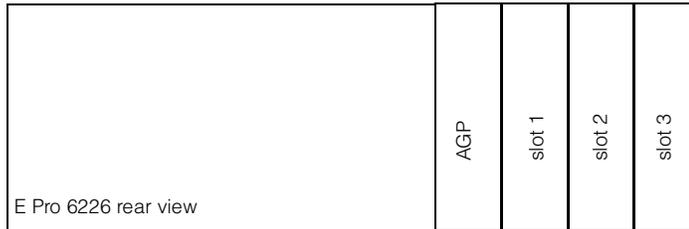
5. Requires either removing the standard CD-ROM and installing in bay three or installing in bay four.

6. Hardware for converting a 5.25in bay to 3.5in is included with the option.

**IntelliStation E Pro 6226 I/O Options**

Part Number	Description	Adapter Length	PCI Support	Slots Supported <sup>1</sup>
<b>Storage Controllers<sup>2</sup></b>				
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>3</sup>	Half	32-bit	1 ... 3
<b>Networking<sup>4</sup></b>				
<b>Ethernet<sup>5</sup></b>				
22P4501	Intel Pro/100S Desktop Adapter	Half	32-bit	1 ... 5
22P6501	Pro/1000 T Desktop Adapter by Intel	Half	32-bit	1 ... 3
22P6901	Wireless LAN Adapter	Half	128-bit	1 ... 3
<b>Token Ring</b>				
34L5001	16/4 Token-ring PCI Management Adapter	Half	32-bit	1 ... 3
34L5201	High-speed 100/16/4 Token-ring PCI Management Adapter	Half	32-bit	1 ... 3
<b>Communications<sup>6</sup></b>				
19K4162	V90 PCI Data/Fax WinModem (Low Profile Enabled)	Half	32-bit	1 ... 3

1. IntelliStation E Pro 6226 has three half-length PCI expansion slots on a single 32-bit, 33MHz bus.  
 2. IntelliStation E Pro 6226 includes an integrated dual channel ATA-100 IDE controller. SCSI models include a single-channel Ultra160 SCSI PCI controller with one internal and one external port (each with high-density 68-pin connectors) installed in slot three.  
 3. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized. The option ships with both full-size and low-profile brackets.  
 4. Wake on LAN is supported through PCI networking adapters that provide this function.  
 5. The integrated 10/100/1000 Broadcom-based Ethernet controller supports Wake on LAN.  
 6. E Pro 6226 includes four USB ports (two each on front and rear of chassis), two 9-pin serial ports, one 25-pin parallel port, AC 97 audio line in/out jacks, and a microphone in jack.



- PCI slots 1, 2 and 3 are 32-bit, 33MHz on a single PCI bus.
- All slots support 5v or universal adapters.
- Standard video adapter is installed in the AGP slot.



**IntelliStation E Pro 6226 Power , Monitors & Accessories**

Part Number	Description
<b>Power</b>	
	IntelliStation E Pro 6226 includes a 200w voltage-sensing power supply and a single line cord.
<b>Uninterruptible Power Supply (UPS)</b>	
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
<b>Monitors<sup>1</sup></b>	
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black
6657HG2	T750 Hybrid Flat Panel Color Monitor 17in (433mm, 17in viewable image), stealth black
6652U3N	P275 Color Monitor 21 in (503mm, 19.8in viewable image), stealth black
6639U3N	P77 Color Monitor 17in (406mm, 16in viewable image), stealth black
6651U3N	P97 Color Monitor 19in (457.3mm, 18in viewable image), stealth black
655163N	P96 Color Monitor 19in (454mm, 17.9in viewable image), stealth black
6656HG2	T560 Hybrid Flat Panel Monitor 15in (381mm, 15in viewable image), stealth black
9494HBO	T860 Hybrid Flat Panel Monitor 18.1in (460mm, 18.1in viewable image), stealth black,
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black
<b>Keyboard and Mouse<sup>2</sup></b>	
22P5185	Rapid Access III USB Keyboard, stealth black
22P5150	TrackPoint USB Space Saver Keyboard
28L3644	Space Saver II Keyboard
33L3252	SpaceBall 3D Input Device

1. Refer to IntelliStation Video Adapter Selection Guide for information regarding video adapter connections.  
 2. IntelliStation E Pro 6226 ships standard with a keyboard and mouse.

**IntelliStation E Pro 6226 Tape Options**

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Encl
48P7042	20/40GB TR7 Internal IDE Tape Drive <sup>1</sup>	1	-	89mm (3.5in) SL or 133mm (5.25in) HH	-	-

1. Install in bay four, attaching to the second drop of the two-drop IDE cable to which the standard CD-ROM is connected.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.





# IntelliStation M Pro 6219

## EMEA Part Number Cross Reference

IntelliStation M Pro 6219 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
KT710xx	621910U	6219-10G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KT712xx	621912U	6219-12G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KT721xx	621921U	6219-21G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KT722xx	621922U	6219-22G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, Matrox Millenium G450 DVI, Windows XP, Desktop	---
N/A	621923U	---	P4 2.67GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
KT726xx	621926U	6219-26G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KT727xx	621927U	6219-27G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KT732xx	621932U	6219-32G	P4 2.8GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KT734xx	621934U	6219-34G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 580XGL, Windows XP, Desktop	---
KT735xx	621935U	6219-35G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro FX1000, Windows XP, Desktop	---
KT736xx	621936U	6219-36G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KT737xx	621937U	6219-37G	P4 2.8GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, Windows XP, Desktop	---
N/A	621938U	---	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KT739xx	621939U	6219-39G	P4 2.8GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, Windows XP, Desktop	---
KT742xx	621942U	6219-42G	P4 3.06GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KT745xx	621945U	6219-45G	P4 3.06GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro FX1000, Windows XP, Desktop	---
KT746xx	621946U	6219-46G	P4 3.06GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KT747xx	621947U	6219-47G	P4 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, Windows XP, Desktop	---
KT748xx	621948U	6219-48G	P4 3.06GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KT749xx	621949U	6219-49G	P4 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, Windows XP, Desktop	---
KT7A0xx	N/A	6219-A0G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KT7A2xx	N/A	6219-A2G	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KT7B1xx	N/A	6219-B1G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KT7B2xx	N/A	6219-B2G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KT7B3xx	N/A	6219-B3G	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	---
KT7B6xx	N/A	6219-B6G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KT7B7xx	N/A	6219-B7G	P4 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KT7C2xx	N/A	6219-C2G	P4 2.8GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KT7C4xx	N/A	6219-C4G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	---
KT7C5xx	N/A	6219-C5G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 580XGL, DOS 2000 Lic., Desktop	---
KT7C6xx	N/A	6219-C6G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KT7C7xx	N/A	6219-C7G	P4 2.8GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, DOS 2000 Lic., Desktop	---
KT7C8xx	N/A	6219-C8G	P4 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KT7C9xx	N/A	6219-C9G	P4 2.8GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, DOS 2000 Lic., Desktop	---
KT7D2xx	N/A	6219-D2G	P4 3.06GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KT7D5xx	N/A	6219-D5G	P4 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro FX 1000, DOS 2000 Lic., Desktop	---
KT7D6xx	N/A	6219-D6G	P4 3.06GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KT7D7xx	N/A	6219-D7G	P4 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, DOS 2000 Lic., Desktop	---
KT7D8xx	N/A	6219-D8G	P4 3.06GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KT7D9xx	N/A	6219-D9G	P4 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, DOS 2000 Lic., Desktop	---

# IntelliStation M Pro 6219

## EMEA Part Number Cross Reference

IntelliStation M Pro 6219 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	19K4162	---	V90 PCI Data/Fax WinModem (Low Profile Enabled)	N/A

IntelliStation E Pro 6219 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
SUP072Y	94G3134	---	APC Smart-UPS 700	---
SUP102Y	94G3135	---	APC Smart-UPS 1000	---
32P16xx	32P1020	---	APC 2U Smart-UPS 1400 RMiB	---

Note 1

6. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

IntelliStation M Pro 6219 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
T39U3xx	6639U3N	6639-U3N	P77 17" (16" viewable image) Colour Monitor (S/Black)	---
T1U3Nxx	6651U3N	6651-U3N	P97 19" (18" viewable image) Colour Monitor (S/Black)	---
T52U3xx	6652U3N	6652-U3N	P275 21" (19.8" viewable image) Colour Monitor (S/Black)	---
T3DG3xx	9503DG3	9503-DG3	T221 22.2" Flat Panel Colour Monitor (S/Black)	---
T41ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---
T56HGxx	6656HG2	6656-HG2	T560 15" Flat Panel Colour Monitor (S/Black)	---
T4HB0xx	9494HB0	9494-HB0	T860 18.1" Hybrid Flat Panel Color Monitor (S/Black)	---

Note 2

2. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa /Pakistan, CH=Switzerland, UK=UK, EU=Europe.

IntelliStation M Pro 6219 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
31P74xx	31P7415	---	IBM Preferred Pro Full-size Keyboard - 104 keys	---
22P5xxx	22P5185	---	IBM Rapid Access III USB Keyboard with HUB	---
28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

Note 3

Note 4

3. Where 'xx' represents a specific country code as follows:- 16=Arabia, 17=Belg/Fre, 18=Belg/UK, 19=Bulgaria, 21=Czech Republic, P/N 31P8767=Czech/US, 22=Denmark, 23=Netherlands, 24=France, 27=Germany, 28=Greece, 29=Israel, 30=Hungary, 31=Iceland, 32=Italy, P/N 31P8250=Italian 141, 36=Norway, 37=Poland, 38=Portugal, 39=Romania, 40=Russia, 41=Rus/Cyrillic, 42=Serb/Cyrillic, 43=Slovak, 44=Spanish, 45=Sweden/Finland, 46=Switzerland, 48=Turkey 440, 49=Turkey 179, 50=UK English, 51=US/Euro, 52=Yugoslavia/La

4. Where 'xxx' represents a specific country code as follows: 189=Belgian/English, 190=Danish, 191=Dutch, 192=French, 193=German, 194=Greek, 195=Icelandic, 196=Italian, 197=Norwegian, 198=Spanish, 199=Swedish/Finnish, 200=Swiss, 201=UK English, 202=US International, 205=Arabic, P/N 31P8769=Czech/US.



# IntelliStation M Pro 6219

*Part Number<sup>1</sup>*    
 *Processor Speed (GHz)<sup>2</sup>*    
 *Number of Processors (Std/Max)*    
 *L2 ECC Cache*    
 *Memory (Std/Max)<sup>3</sup>*    
 *Video Adapter*    
 *Form Factor*    
 *Onboard Ethernet (Mbps)<sup>4</sup>*    
 *SCSI Controller (Dual, Ultra, RAID)<sup>5</sup>*    
 *Removable Media Bays (Total/Avail)*    
 *Internal HDD Storage (Std/Max)*    
 *Optical Drive (IDE)<sup>8</sup>*    
 *Bays (Total/Avail)*    
 *Slots (Total/Avail)*

IntelliStation M Pro 6219 At-A-Glance													
6219-10U	2.4	1/1	512KB	256MB/4GB	Matrox Millennium G450 DVI	Tower	10/100/1000	IDE	3/1	40GB/360GB <sup>6</sup>	CD-ROM <sup>9</sup>	7/4	5/5
6219-12U	2.4	1/1	512KB	256MB/4GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	IDE	3/1	40GB/360GB <sup>6</sup>	CD-ROM <sup>9</sup>	7/4	5/5
6219-21U	2.67	1/1	512KB	512MB/4GB	Matrox Millennium G450 DVI	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	DVD/CD-RW <sup>10</sup>	7/4	5/5
6219-22U	2.67	1/1	512KB	512MB/4GB	Matrox Millennium G450 DVI	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	DVD/CD-RW <sup>12</sup>	7/4	5/5
6219-23U	2.67	1/1	512KB	512MB/4GB	NVIDIA Quadro4 580XGL	Tower	10/100/1000	IDE	3/1	40GB/360GB <sup>6</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-26U	2.67	1/1	512KB	512MB/4GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>11</sup>	7/4	5/5
6219-27U	2.67	1/1	512KB	512MB/4GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-32U	2.8	1/1	512KB	512MB/4GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	IDE	3/1	40GB/360GB <sup>6</sup>	CD-ROM <sup>9</sup>	7/4	5/5
6219-34U	2.8	1/1	512KB	512MB/4GB	NVIDIA Quadro5 580XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-35U	2.8	1/1	512KB	512MB/4GB	NVIDIA Quadro FX 1000	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-36U	2.8	1/1	512KB	512MB/4GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>11</sup>	7/4	5/5
6219-37U	2.8	1/1	512KB	1GB/4GB	3Dlabs Wildcat4 7110	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>11</sup>	7/4	5/4 <sup>14</sup>
6219-38U	2.8	1/1	512KB	512MB/4GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-39U	2.8	1/1	512KB	1GB/4GB	3Dlabs Wildcat4 7110	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/4 <sup>14</sup>
6219-42U	3.06	1/1	512KB	512MB/4GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	IDE	3/1	40GB/360GB <sup>6</sup>	CD-ROM <sup>9</sup>	7/4	5/5
6219-45U	3.06	1/1	512KB	512MB/4GB	NVIDIA Quadro FX 1000	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-46U	3.06	1/1	512KB	512MB/4GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>11</sup>	7/4	5/5
6219-47U	3.06	1/1	512KB	1GB/4GB	3Dlabs Wildcat4 7110	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>11</sup>	7/4	5/4 <sup>14</sup>
6219-48U	3.06	1/1	512KB	512MB/4GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/5
6219-49U	3.06	1/1	512KB	1GB/4GB	3Dlabs Wildcat4 7110	Tower	10/100/1000	U320	3/1	36.4GB/293.6GB <sup>7</sup>	CD-RW <sup>13</sup>	7/4	5/4 <sup>14</sup>

1. IntelliStation M Pro 6219 ships with a keyboard and mouse. See "Power, Monitors and Accessories" for a list of compatible monitors. Tower models are rack-mountable using an optional tower-to-rack conversion kit, or they can be turned on the side and installed as desktop units capable of supporting the weight of a monitor.

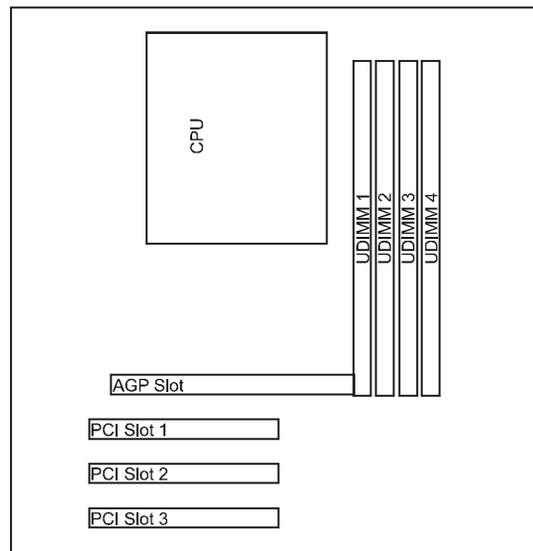


2. Intel Pentium 4 processor with advanced transfer ECC L2 cache, 533MHz (133MHz quad-pumped) Front Side Bus (FSB) and MMX technology.
3. Two-way interleaved PC2100 CL2.5 ECC DDR UDIMMs. Maximum capacity includes four 1GB UDIMMs, requiring replacement of the two standard UDIMMs.
4. A Broadcom-based copper gigabit Ethernet controller is integrated into the planar.
5. All models include an integrated ATA-100 IDE controller, which supports up to four IDE devices (IDE HDDs, IDE optical or IDE tape drives) in IDE models and two IDE devices in SCSI models. IDE models ship with two two-drop IDE cables and SCSI models ship with one two-drop IDE cable. SCSI models include an integrated single-channel Ultra320 SCSI controller that supports up to four nonhot-swap SCSI HDDs attached with a standard four-drop terminated LVD SCSI cable.
6. Maximum storage is based on three 120GB IDE HDDs, which requires replacing the standard 40GB HDD.
7. Maximum storage is based on four 73.4GB SCSI HDDs, which requires replacing the standard 36.4GB 10,000rpm Ultra320 nonhot-swap HDD.
8. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
9. This model ships standard with a 48x-20x CD-ROM drive.
10. This model ships standard with a 32x-10x-40x-16x CD-RW/DVD-ROM combination drive.
11. This model ships standard with a 40x-12x-40x Max CD-RW drive.
12. This model ships standard with a 48x-24x-48x-16x Max CD-RW/DVD-ROM combination drive.
13. This model ships standard with a 48x-24x-48x Max CD-RW drive.
14. The width of the 3Dlabs Wildcat4 7110 video adapter installed in the AGP slot prevents installation of a PCI adapter in slot one.

### IntelliStation M Pro 6219 Memory

Part Number	Memory Description <sup>1</sup>
10K0067	256MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0069	512MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0071	1GB PC2100 CL2.5 ECC DDR SDRAM UDIMM

1. Memory UDIMMs must be installed in pairs using the same option part number according to the following order: UDIMM connectors one and two (set one), then connectors three and four (set two).



Total System Memory <sup>1</sup>			Quantity of UDIMMs Added		
256MB Models	512MB Models	1GB Models	256MB (10K0067)	512MB (10K0069)	1GB (10K0071)
768MB	1GB	1.5GB	2	-	-
1.25GB	1.5GB	2GB	-	2	-
2.25GB	2.5GB	3GB	-	-	2
4GB <sup>2</sup> (max)	4GB <sup>2</sup> (max)	4GB <sup>2</sup> (max)	-	-	4 <sup>2</sup>

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller UDIMMs may provide a more cost-effective alternative to using larger UDIMMs. Memory UDIMMs must be installed in pairs using the same option part number.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires replacing the standard UDIMMs.



**IntelliStation M Pro 6219 Hard Disk Drive (HDD) Storage**

**SCSI Models**

Total Internal Storage <sup>1</sup>	10,000rpm SCSI HDDs			15,000rpm SCSI HDDs	
	18.2GB (06P5750)	36.4GB (06P5751, 32P0723) <sup>3</sup>	73.4GB (06P5752, 32P0724) <sup>3</sup>	36.4GB (32P0784, 06P5766) <sup>3</sup>	73.4GB (32P0785) <sup>3</sup>
36.4GB	Ultra320 36.4GB nonhot-swap HDD standard in SCSI models			-	-
54.6GB	1	-	-	-	-
72.8GB	2	1	-	1	-
91GB	3	-	-	-	-
109.2GB	-	2	-	2	-
145.6GB	-	3	-	3	-
183.2GB	-	-	2	-	2
256.6GB	-	-	3	-	3
293.6GB (max) <sup>3</sup>	-	-	4	-	4

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then add the quantity of HDDs from all columns to the standard HDD.
2. If Ultra160 devices (P/Ns 06P57xx) are connected to the integrated bus, the entire bus is limited to Ultra 160 speeds.
3. Requires replacement of the standard HDD.

**EIDE Models**

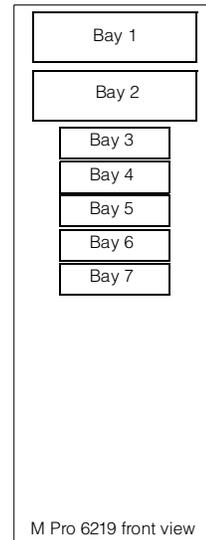
Total Internal Storage <sup>1</sup>	7,200rpm EIDE HDDs <sup>2</sup>			
	40GB (22P7157)	60GB (09N4207)	80GB (09N4226)	120GB (09N4231)
40GB	(Standard on EIDE models)	-	-	-
80GB	1	-	-	-
100GB	-	1	-	-
120GB	2	-	-	-
140GB	1	1	-	-
160GB	-	2	-	-
180GB	-	1	1	-
200GB	-	-	2	-
240GB <sup>3</sup>	-	-	3	-
280GB	-	-	-	2
360GB <sup>3</sup>	-	-	-	3

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then add the quantity of HDDs from all columns to the standard HDD.
2. Supports a maximum of four IDE devices including CD-ROM drives, HDDs, Zip drives and tape drives.
3. Requires replacement of the standard HDD.

Bay	Form Factor	Height	Front Access	Usage
1	133mm (5.25in)	HH	yes	CD-ROM <sup>1</sup>
2	133mm (5.25in)	HH	yes	open <sup>1</sup>
3	89mm (3.5in)	SL	yes	FDD
4	89mm (3.5in)	SL	yes	open <sup>2</sup>
5, 6	89mm (3.5in)	SL	no	open
7	89mm (3.5in)	SL	no	Std HDD

1. Supports removable media devices only. Hard disk drives are not supported.  
 2. Supports a third IDE HDD in IDE models, a fourth SCSI HDD in SCSI models, or a 3.5in IDE tape drive.



Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
<b>IDE HDDs<sup>1, 2</sup></b>					
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4, 6, 7	3
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4, 6, 7	3
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4, 6, 7	3
09N4231	120GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4, 6, 7	3
<b>Ultra160 Nonhot-swap SCSI HDDs<sup>2, 3</sup></b>					
06P5750	18.2GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4 ... 7	4
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4 ... 7	4
06P5752	73.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4 ... 7	4
06P5766	36.4GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	4 ... 7	4
<b>Ultra320 Nonhot-swap SCSI HDDs<sup>2, 3</sup></b>					
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	4 ... 7	4
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	4 ... 7	4
32P0784	36.4GB 15Krpm Ultra320 SCSI HDD	15000	SL	4 ... 7	4
32P0785	73.4GB 15Krpm Ultra320 SCSI HDD	15000	SL	4 ... 7	4
<b>Removable Media Devices</b>				<b>Bays Supported</b>	
10K3782	48x-20x CD-ROM Black Internal IDE Drive <sup>4</sup>	1, 2			
22P6970	Multi-Burner <sup>4, 5</sup>	1, 2			
22P6973	32x/10x/40x/16x Max CD-RW/DVD Combo Drive <sup>4, 5</sup>	1, 2			
22P6950	16x Max RAM-read DVD-ROM Drive <sup>4, 5</sup>	1, 2			
22P6997	48x-24x-48x CD-RW Drive <sup>4</sup>	1, 2			
00N8078	250MB IDE Internal Zip Drive <sup>6</sup>	1, 2, 4			
09N4211	IBM Portable USB 2.0 20GB Hard Drive	-			
05K9276	USB Portable Diskette Drive	-			

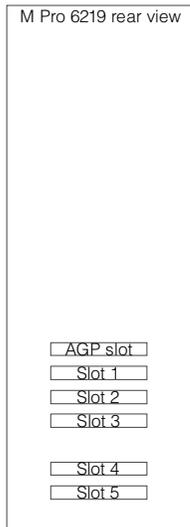
1. IDE models support a maximum of four IDE devices including optical drives, Zip drives, IDE hard disk drives and IDE tape drives.  
 2. Standard HDD installed in bay seven for both SCSI and IDE models.  
 3. Mixing of Ultra160 and Ultra320 HDDs limits the bus to the lower rated performance.  
 4. Either replace the standard Optical Drive or install in the available media bay. An IDE cable with three connectors is included with the optional optical drive. The included audio cable must be connected in order to support audio for music CDs but not for DVD-ROM.  
 5. DVD video playback is not supported for models that include a 3DLabs Wildcat4 7110 video adapter.  
 6. Hardware for converting a 5.25in bay to 3.5in is included with the option.



**IntelliStation M Pro 6219 I/O Options**

Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>2</sup>
<b>Storage Controllers<sup>3</sup></b>				
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>4</sup>	Half	32-bit	1 ... 5
06P5740	ServeRAID-4Lx Ultra 160 SCSI Controller <sup>5</sup>	Half	64-bit	1 ... 5
71P8592	ATA133 RAID Controller <sup>6</sup>	Half	32-bit	1 ... 5
<b>Networking</b>				
<b>Ethernet<sup>7</sup></b>				
22P6501	Pro/1000 T Desktop Adapter by Intel <sup>8</sup>	Half	32-bit	1 ... 5
22P6901	Wireless LAN Adapter	Half	128-bit	1 ... 5
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>8</sup>	Half	64-bit	1 ... 5
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	1 ... 5
<b>Token Ring</b>				
34L5201	High-speed 100/16/4 Token-Ring PCI Management Adapter <sup>8</sup>	Half	32-bit	1 ... 5
<b>Communications<sup>9</sup></b>				
33L4618	V90 PCI Data/Fax Modem	Half	32-bit	1 ... 5

1. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot.
2. A dedicated PCI slot supports a standard AGP graphics adapter located above the five PCI expansion slots. When the standard graphics adapter is a 3DLabs Wildcat4 7110, slot one is not available to install another adapter. Models 21U, 26U, 36U, 37U, 46U and 47U do not support 64-bit or PCI-X adapters due to interference caused by the Firewire adapter.
3. IntelliStation M Pro 6219 includes an integrated dual-channel ATA-100 IDE controller. SCSI models include a single-channel Ultra320 SCSI controller with one internal high-density 68-pin connector.
4. PCI Wide Ultra160 SCSI Adapter provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized.
5. ServeRAID-4Lx Ultra 160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
6. ATA133 RAID Controller (P/N 71P8592) supports RAID levels 0, 1 and 10 on up to four ATA66, 100 or 133 EIDE HDDs (only four IDE devices can be installed). The dual channel IDE controller includes two internal 40-pin connectors, two 18-inch single-drop IDE cables (P/N 02R0719) and two 23-inch two-drop IDE cables (P/N 02R0721).
7. The integrated full duplex 10/100/1000 Broadcom-based Ethernet controller supports Wake on LAN.
8. Wake on LAN is supported through these PCI networking adapters.
9. IntelliStation M Pro 6219 includes four USB ports (two each on front and rear of chassis), two 9-pin serial ports, one 25-pin parallel port, AC 97 audio line in/out and microphone in jacks. An integrated IEEE 1394 Firewire digital multimedia port is provided in models that support SCSI HDDs (slot one is not available in these models for installation of 64-bit or PCI-X adapters).



All PCI expansion slots are full-length, 32-bit, 33MHz, 5v on a single PCI bus.



**IntelliStation M Pro 6219 Power, Monitors & Accessories**

<b>Part Number</b>	<b>Description</b>
<b>Power</b>	
	IntelliStation M Pro 6219 includes a 340w voltage-sensing power supply and a single line cord.
<b>Tower Uninterruptable Power Supply (UPS)</b>	
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
<b>Rack-mount Uninterruptable Power Supply (UPS)</b>	
32P1020	APC 2U Smart-UPS 1400RMB
<b>Monitors<sup>1</sup></b>	
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black
6639U3N	P77 Color Monitor 17in (406mm, 16in viewable image), stealth black
6651U3N	P97 Color Monitor 19in (457.3mm, 18in viewable image), stealth black
6652U3N	P275 Color Monitor 21in (503mm, 19.8in viewable image), stealth black
9503DG3	T221 Flat Panel Monitor 22.2in (564mm, 22.2in viewable image), stealth black
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black
6656HG2	T560 Hybrid Flat Panel Monitor 15in (381mm, 15in viewable image), stealth black
9494HB0	T860 Hybrid Flat Panel Monitor 18.1in (460mm, 18.1in viewable image), stealth black
<b>Conversion Kit</b>	
09N4300	4Ux20D Tower-to-Rack Kit
<b>Keyboard and Mouse<sup>2</sup></b>	
31P7415	Preferred Pro Full-size Keyboard - 104 Keys (stealth black)
22P5185	Rapid Access III USB Keyboard, stealth black
28L3673	Sleek 2-Button Stealth Black Mouse
31P7405	Optical 3-button ScrollPoint Mouse - 800dpi PS/2 and USB
31P8700	Optical 3-button ScrollPoint Pro Mouse - 800dpi PS/2 and USB
33L3244	Sleek USB Mouse (stealth black)
33L3252	SpaceBall 3D Input Device

1. Refer to the IntelliStation Video Adapter Selection Guide for information regarding video adapter connections.  
 2. IntelliStation M Pro 6219 ships standard with an IBM 104-key keyboard and three-button mouse.



**IntelliStation M Pro 6219 Tape Options**

<b>Part Number</b>	<b>Tape Drives</b>	<b>Bays Supported</b>	<b>SCSI Interface</b>	<b>Form Factor</b>	<b>Termination Included</b>	<b>Ext Tape Encl<sup>5</sup></b>
48P7042	20/40GB TR7 Internal IDE Tape Drive <sup>1</sup>	2, 4	-	89mm (3.5in) SL or 133mm (5.25in) HH	-	-
00N7991	20/40GB DDS/4 4mm Internal Tape Drive <sup>2</sup>	2	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>4</sup>	3510020 <sup>6</sup>
<b>External Tape Enclosures</b>						
3510020	External Half-High SCSI Storage Enclosure <sup>3</sup>	-	16 LVD	Desktop	N	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	3510020

Note:

SCSI models include an integrated single-channel Ultra320 SCSI controller and a four-drop multimode terminated LVD SCSI cable. IDE models include two two-drop IDE cables. All SCSI tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646), which includes a five-drop multimode terminated LVD SCSI cable and an external 08mm VHDCI connector. SCSI tape drives installed internally in SCSI models can be connected to the integrated controller using the cable that ships with the tape drive if the HDDs are attached to ServeRAID-4Lx. SCSI tape drives installed in IDE models require an optional SCSI storage controller. The IDE tape drive shares an IDE bus with the standard optical drive by attaching to one drop of the standard two-drop IDE cable.

1. SCSI models include a two-drop IDE cable for attachment to the CD-ROM and an IDE tape drive. IDE models include two two-drop IDE cables.
2. IDE models require a SCSI storage controller in order to install a SCSI tape drive.
3. To determine external cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
4. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option.
5. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.





# IntelliStation Z Pro 6221

## EMEA Part Number Cross Reference

IntelliStation Z Pro 6221 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
KPK10xx	622110U	6221-10G	Xeon 2.4GHz/533MHz, 512KB, 512MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KPK22xx	622122U	6221-22G	Xeon 2.67GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KPK29xx	622129U	6221-29G	Xeon 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KPK33xx	622133U	6221-33G	Xeon 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KPK36xx	622136U	6221-36G	Xeon 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KPK37xx	622137U	6221-37G	Xeon 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, Windows XP, Desktop	---
KPK38xx	622138U	6221-38G	Xeon 2.8GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KPK40xx	622140U	6221-40G	Xeon 3.06GHz/533MHz, 512KB, 512MB, 40GB EIDE, Matrox Millenium G450 DVI, Windows XP, Desktop	---
KPK42xx	622142U	6221-42G	Xeon 3.06GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, Windows XP, Desktop	---
KPK46xx	622146U	6221-46G	Xeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KPK47xx	622147U	6221-47G	Xeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, Windows XP, Desktop	---
KPK48xx	622148U	6221-48G	Xeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro FX1000, Windows XP, Desktop	---
KPK49xx	622149U	6221-49G	2xXeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, Windows XP, Desktop	---
KPKA0xx	N/A	6221-A0G	Xeon 2.4GHz/533MHz, 512KB, 512MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KPKB2xx	N/A	6221-B2G	Xeon 2.67GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KPKB9xx	N/A	6221-B9G	Xeon 2.67GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KPKC3xx	N/A	6221-C3G	Xeon 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KPKC6xx	N/A	6221-C6G	Xeon 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KPKC7xx	N/A	6221-C7G	Xeon 2.8GHz/533MHz, 512KB, 512MB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, DOS 2000 Lic., Desktop	---
KPKC8xx	N/A	6221-C8G	Xeon 2.8GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KPKD0xx	N/A	6221-D0G	Xeon 3.06GHz/533MHz, 512KB, 512MB, 40GB EIDE, Matrox Millenium G450 DVI, DOS 2000 Lic., Desktop	---
KPKD2xx	N/A	6221-D2G	Xeon 3.06GHz/533MHz, 512KB, 512MB, 40GB EIDE, NVIDIA Quadro4 280NVS, DOS 2000 Lic., Desktop	---
KPKD6xx	N/A	6221-D6G	Xeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---
KPKD7xx	N/A	6221-D7G	Xeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, 3Dlabs Wildcat4 7110, DOS 2000 Lic., Desktop	---
KPKD8xx	N/A	6221-D8G	Xeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro FX1000, DOS 2000 Lic., Desktop	---
KPKD9xx	N/A	6221-D9G	2xXeon 3.06GHz/533MHz, 512KB, 1GB, 36.4GB SCSI, NVIDIA Quadro4 980XGL, DOS 2000 Lic., Desktop	---

# IntelliStation Z Pro 6221

## EMEA Part Number Cross Reference

IntelliStation Z Pro 6221 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	19K4162	---	V90 PCI Data/Fax WinModem (Low Profile Enabled)	N/A

IntelliStation Z Pro 6221 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
SUP072Y	94G3134	---	APC Smart-UPS 700	---
SUP102Y	94G3135	---	APC Smart-UPS 1000	---
32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---

Note 1

1. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

IntelliStation Z Pro 6221 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
T52U3xx	6652U3N	6652-U3N	P275 21" (19.8" viewable image) Colour Monitor (S/Black)	---
T39U3xx	6639U3N	6639-U3N	P77 17" (16" viewable image) Colour Monitor (S/Black)	---
T1U3Nxx	6651U3N	6651-U3N	P97 19" (18" viewable image) Colour Monitor (S/Black)	---
T56HGxx	6656HG2	6656-HG2	T560 15" Flat Panel Colour Monitor (S/Black)	---
T4HB0xx	9494HB0	9494-HB0	T860 18.1" Hybrid Flat Panel Color Monitor (S/Black)	---
T41ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---
T3DG3xx	9503DG3	9503-DG3	T221 22.2" Flat Panel Colour Monitor (S/Black)	---

Note 2

2. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa /Pakistan, CH=Switzerland, UK=UK, EU=Europe.

IntelliStation Z Pro 6221 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
22P5xxx	22P5185	---	IBM Rapid Access III USB Keyboard with HUB	---
31P74xx	31P7415	---	IBM Preferred Pro Full-size Keyboard - 104 keys	---
28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

Note 3

Note 4

3. Where 'xxx' represents a specific country code as follows: 189=Belgian/English, 190=Danish, 191=Dutch, 192=French, 193=German, 194=Greek, 195=Icelandic, 196=Italian, 197=Norwegian, 198=Spanish, 199=Swedish/Finnish, 200=Swiss, 201=UK English, 202=US International, 205=Arabic, P/N 31P8769=Czech/US.

4. Where 'xx' represents a specific country code as follows:- 16=Arabia, 17=Belg/Fre, 18=Belg/UK, 19=Bulgaria, 21=Czech Rep., P/N 31P8767=Czech/US, 22=Denmark, 23=Netherlands, 24=France, 27=Germany, 28=Greece, 29=Israel, 30=Hungary, 31=Iceland, 32=Italy, P/N 31P8250=Italian 141, 36=Norway, 37=Poland, 38=Portugal, 39=Romania, 40=Russia, 41=Rus/Cyrillic, 42=Serb/Cyrillic, 43=Slovak, 44=Spanish, 45=Sweden/Finland, 46=Switzerland, 48=Turkey 440, 49=Turkey 179, 50=UK English, 51=US/Euro, 52=Yugoslavia/Latin

IntelliStation Z Pro 6221 Tape Options				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
10L7440	3510020	---	External Half High SCSI Storage Enclosure	---



# IntelliStation Z Pro 6221

Part Number<sup>1</sup>  
 Processor Speed (GHz)<sup>2</sup>  
 Number of Processors (Std/Max)<sup>3</sup>  
 L2 ECC Cache (KB)  
 Memory (Std/Max)<sup>3</sup>  
 Video Adapter  
 Form Factor  
 Onboard Ethernet (Mbps)<sup>4</sup>  
 SCSI Controller (Dual, Ultra, RAID)<sup>5</sup>  
 Removable Media Bays (Total/Avail)  
 Internal HDD Storage (Std/Max)  
 (Optical Drive)<sup>9</sup>  
 Bays (Total/Avail)  
 Slots (Total/Avail)

## IntelliStation Z Pro 6221 At-A-Glance

Part Number <sup>1</sup>	Processor Speed (GHz) <sup>2</sup>	Number of Processors (Std/Max) <sup>3</sup>	L2 ECC Cache (KB)	Memory (Std/Max) <sup>3</sup>	Video Adapter	Form Factor	Onboard Ethernet (Mbps) <sup>4</sup>	SCSI Controller (Dual, Ultra, RAID) <sup>5</sup>	Removable Media Bays (Total/Avail)	Internal HDD Storage (Std/Max)	(Optical Drive) <sup>9</sup>	Bays (Total/Avail)	Slots (Total/Avail)
6221-10U	2.4	1/2	512	512MB/8GB	Matrox Millennium G450 DVI	Tower	10/100/1000	D, U320	3/1	40GB/ 240GB <sup>7</sup>	48x-20x	6/3	5/5
6221-22U	2.67	1/2	512	512MB/8GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	D, U320	3/1	40GB/ 240GB <sup>7</sup>	48x-20x	6/3	5/5
6221-29U	2.67	2/2	512	512MB/8GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	DVD CD-RW	6/3	5/5
6221-33U	2.8	1/2	512	512MB/8GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	48x-20x	6/3	5/5
6221-36U	2.8	1/2	512	1GB/8GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	CD-R/RW	6/3	5/5
6221-37U	2.8	1/2	512	1GB/8GB	3Dlabs Wildcat4 7110	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	DVD CD-RW	6/3	5/4 <sup>10</sup>
6221-38U	2.8	1/2	512	1GB/8GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	CD-RW	6/3	5/5
6221-40U	3.06	1/2	512	512MB/8GB	Matrox Millennium G450 DVI	Tower	10/100/1000	D, U320	3/1	40GB/ 240GB <sup>7</sup>	48x-20x	6/3	5/5
6221-42U	3.06	1/2	512	512MB/8GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	D, U320	3/1	40GB/ 240GB <sup>7</sup>	48x-20x	6/3	5/5
6221-46U	3.06	1/2	512	1GB/8GB	NVIDIA Quadro4 980XGL	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	DVD	6/3	5/5
6221-47U	3.06	1/2	512	1GB/8GB	3Dlabs Wildcat4 7110	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	DVD	6/3	5/4 <sup>10</sup>
6221-48U	3.06	1/2	512	1GB/8GB	NVIDIA Quadro FX 1000	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	DVD	6/3	5/5
6221-49U	3.06	2/2	512	1GB/8GB	NVIDIA Quadro4 280NVS	Tower	10/100/1000	D, U320 <sup>6</sup>	3/1	36.4GB/ 440.4GB <sup>8</sup>	DVD	6/3	5/5

1. IntelliStation Z Pro 6221 ships with a keyboard and mouse. See "Power, Monitors and Accessories" for a list of compatible monitors. Tower models are rack-mountable using an optional tower-to-rack conversion kit, or they can be turned on the side and installed as desktop units capable of supporting the weight of a monitor.

2. Intel Xeon processor with advanced transfer ECC L2 cache and 533MHz (quad-pumped) Front Side Bus (FSB).

3. High-speed, two-way interleaved 133MHz DDR PC2100 RDIMM. Maximum capacity includes four 2GB RDIMMs, requiring replacement of the two standard RDIMMs.

4. A Broadcom-based copper gigabit Ethernet controller is integrated into the planar.

5. All models include both an integrated ATA-100 IDE controller and an integrated Ultra320 SCSI controller. The IDE controller supports up to four IDE devices. Two two-drop IDE cables are included. Because the standard IDE cable is not long enough to attach to both an IDE HDD and an IDE device installed in either removable media bay, only two IDE HDDs are supported. Channel A of the integrated dual-channel Ultra320 SCSI controller supports one internal connector. The channel B connector supports one external 68-pin high density port with the addition of optional Enabling Cable for External Ultra320 SCSI Port (P/N 24P7929). SCSI models include a three-drop LVD SCSI cable that supports up to three internal nonhot-swap SCSI HDDs.

6. The dual-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 SCSI HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed. One additional HDD may be designated as a hot-spare for HDDs configured in the onboard mirror. Mirrored and hot-spare HDDs must be matched.

7. IDE models include two two-drop ATA-100 IDE cables. One connector of one cable is attached to the standard CD-ROM and the other connector can be used to attach an additional optical drive. The second two-drop cable connects up to two IDE HDDs. Maximum storage is based on two 120GB IDE HDDs, which requires replacing the standard 40GB HDD.

8. Maximum amount requires replacement of the standard 36.4GB 10,000rpm HDD with a 146.8GB HDD and installing two additional 146.8GB HDDs.

9. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

10. The width of the 3Dlabs Wildcat 4 7110 video adapter installed in the AGP slot prevents installation of a PCI adapter in slot one.

**IntelliStation Z Pro 6221 Processors**

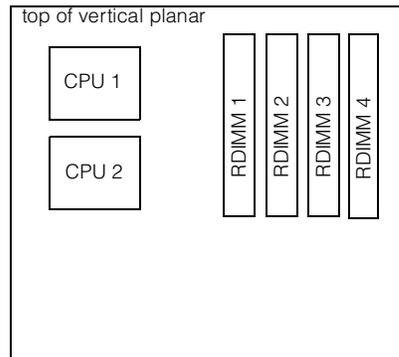
Part Number	Processor Upgrades	SMP Support <sup>1</sup>
24P7468	2.4GHz/533MHz-512KB Cache Xeon Second Processor for 6221	10U
59P5109	2.67GHz/533MHz-512KB Cache Xeon Second Processor for 6221	2xU
59P5110	2.8GHz/533MHz-512KB Cache Xeon Second Processor for 6221	3xU
24P8123	3.06GHz/533MHz-512KB Cache Xeon Second Processor for 6221	4xU

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed and cache size.

**IntelliStation Z Pro 6221 Memory**

Part Number	Memory Description <sup>1</sup>
33L5037	256MB DDR PC2100 ECC RDIMM
33L5038	512MB DDR PC2100 ECC RDIMM
33L5039	1GB DDR PC2100 ECC RDIMM
33L5040	2GB PC2100 CL2.5 ECC DDR SDRAM RDIMM

1. Due to two-way interleaving, installation of memory options in matched pairs beginning with RDIMMs three and four is required. Standard RDIMMs are installed in sockets three and four.



Total System Memory <sup>1</sup>		Quantity of RDIMMs Added			
512MB (2x256MB) Models	1GB (2x512MB) Models	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)	2GB (33L5040)
1GB	1.5GB	2	-	-	-
1.5GB	2GB	-	2	-	-
2.5B	3GB	-	-	2	-
4.5GB	5GB	-	-	-	2
5GB <sup>2</sup>	-	-	2	-	2
6GB <sup>2</sup>	6GB <sup>2</sup>	-	-	2	2
8GB <sup>2</sup>	8GB <sup>2</sup>	-	-	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires replacing the standard RDIMM.



**IntelliStation Z Pro 6221 Hard Disk Drive (HDD) Storage**

<b>SCSI models</b>						
<b>Total Internal Storage<sup>1</sup></b>	<b>10,000rpm SCSI HDDs</b>				<b>15,000rpm SCSI HDD</b>	
	<b>18.2GB (06P5750)</b>	<b>36.4GB (06P5751, 32P0723)<sup>3</sup></b>	<b>73.4GB (06P5752, 32P0724)<sup>3</sup></b>	<b>146.8GB (32P0725)</b>	<b>36.4GB (32P0784)</b>	<b>73.4GB (32P0785)</b>
36.4GB	Standard on SCSI models					
54.6GB	1	-	-	-	-	-
72.8GB	2	1	-	-	1	-
109.8GB	-	-	1	-	-	1
183.2GB	-	-	2	-	-	2
220.2GB <sup>2</sup>	-	-	3	-	-	3
293.6GB <sup>2</sup>	-	-	-	2	-	-
440.4GB <sup>2</sup>	-	-	-	3	-	-

This table does not represent all possible HDD configurations.

1. Select a total storage row then add the quantity of HDDs from the column of the preferred HDD to the standard HDD.
2. Requires replacement of the standard HDD.
3. Mixing of Ultra160 and Ultra320 HDDs limits the bus to the lower rated performance.

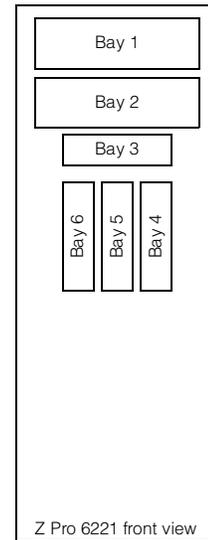
<b>EIDE Models</b>				
<b>Total Internal Storage<sup>1</sup></b>	<b>7200RPM IDE HDDs<sup>2</sup></b>			
	<b>40GB (22P7157)</b>	<b>60GB (09N4207)</b>	<b>80GB (09N4226)</b>	<b>120GB (09N4231)</b>
40GB	Standard on EIDE models			
80GB	1	-	-	-
100GB	-	1	-	-
160GB	-	-	-	1
200GB <sup>3</sup>	-	-	1	1
240GB <sup>3</sup>	-	-	-	2

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then add the quantity of HDDs from all columns to the standard HDD.
2. Supports a maximum of four IDE devices including CD-ROM drives, HDDs and IDE tape drives. Neither of the standard two-drop IDE cables is long enough for attachment to both an IDE HDD and an IDE device installed in either removable media bay.
3. Requires replacing the standard HDD.

Bay	Form Factor	Height	Front Access	Usage
1	133mm (5.25in)	HH	yes	standard optical drive <sup>1</sup>
2	133mm (5.25in)	HH	yes	removable media <sup>1</sup>
3	89mm (3.5in)	SL	yes	FDD
4, 5	89mm (3.5in)	SL	no	open
6	89mm (3.5in)	SL	no	standard HDD

1. Supports removable media devices only. Hard disk drives are not supported.



Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
<b>IDE HDDs<sup>1, 2</sup></b>					
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4 ... 6	2
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4 ... 6	2
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4 ... 6	2
09N4231	120GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	4 ... 6	2
<b>Nonhot-swap Ultra160 SCSI HDDs<sup>2</sup></b>					
06P5750	18.2GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4 ... 6	3
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4 ... 6	3
06P5752	73.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4 ... 6	3
<b>Nonhot-swap Ultra320 HDDs<sup>2</sup></b>					
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	4 ... 6	3
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	4 ... 6	3
32P0725	146.8GB 10Krpm Ultra320 SCSI HDD	10000	SL	4 ... 6	3
32P0784	36.4GB 15Krpm Ultra320 SCSI HDD	15000	SL	4 ... 6	3
32P0785	73.4GB 15Krpm Ultra320 SCSI HDD	15000	SL	4 ... 6	3
<b>Associated Options</b>					
24P7929	Enabling Cable for External Ultra320 SCSI Port <sup>3</sup>	-	-	-	1
<b>Removable Media Devices</b>			<b>Bays Supported</b>		
10K3782	48x-20x IDE CD-ROM <sup>4</sup>	1, 2			
22P6973	32x-10x-40x-16x Max CD-RW/DVD-ROM Combination Drive <sup>4, 5</sup>	1, 2			
22P6950	16x Max RAM-Read DVD-ROM Drive <sup>4, 5</sup>	1, 2			
00N8078	250MB IDE Internal Zip Drive <sup>6</sup>	1, 2			

1. IDE models support a maximum of four IDE devices including optical drives, IDE hard disk drives and IDE tape drives. Neither of the standard two-drop IDE cables is long enough for attachment to both an IDE HDD and an IDE device installed in either removable media bay.

2. Standard HDD installed in bay six for both SCSI and IDE models. Mixing of Ultra160 and Ultra320 HDDs limits the bus to the lower rated performance.

3. Required to enable the external 68-pin high density SCSI port. Attaches to Channel B of the integrated Ultra320 SCSI controller.

4. Either replace the standard CD-ROM or install in the available media bay. An IDE cable with three connectors is included with the optional optical drive. The included audio cable must be connected in order to support audio for music CDs but not for DVD-ROM.

5. DVD video playback is not supported for models that include a 3DLabs Wildcat4 7110 video adapter.

6. Hardware for converting a 5.25in bay to 3.5in is included with the option.



## IntelliStation Z Pro 6221 I/O Options

Part Number	Description	Adapter Length	PCI Support <sup>3</sup>	Slots Supported <sup>4</sup>
<b>Storage Controllers<sup>1, 2</sup></b>				
19K4646	PCI Wide Ultra 160 SCSI Adapter <sup>5</sup>	Half	32-bit	1 ... 5
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>6</sup>	Half	64-bit	2 ... 5
71P8592	ATA133 RAID Controller <sup>7</sup>	Half	32-bit	1 ... 5
<b>Networking</b>				
<b>Ethernet<sup>8</sup></b>				
22P4501	Intel Pro/100S Desktop Adapter <sup>9</sup>	Half	32-bit	1 ... 5
22P6501	Pro/1000 T Desktop Adapter by Intel <sup>9</sup>	Half	32-bit	1 ... 5
22P6901	Wireless LAN Adapter	Half	128-bit	2 ... 5
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	2 ... 5
<b>Token Ring</b>				
34L5001	16/4 Token-Ring PCI Management Adapter <sup>9</sup>	Half	32-bit	1 ... 5
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter <sup>9</sup>	Half	32-bit	1 ... 5
<b>Communications<sup>10</sup></b>				
33L4618	V90 PCI Data/Fax Modem	Half	32-bit	1

1. The dual-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed. One additional HDD may be designated as a hot-spare for HDDs configured in the onboard mirror. Mirrored and hot-spare HDDs must be matched.

2. Z Pro 6221 includes a dual-channel Ultra320 SCSI controller with two internal connectors. An external high-density 68-pin connector can be enabled using optional Enabling Cable for External Ultra320 SCSI Port (P/N 24P7929) to connect channel B to an external SCSI connector. External connection using this option and the external knockout is not supported if both channels of the integrated controller are connected internally, in which case a supported PCI SCSI controller is required to support an external SCSI device.

3. A 32-bit adapter installed into a 64-bit slot will restrict the data transfer rate to 32-bit. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot. 33MHz adapters will reduce 100MHz buses to 33MHz. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers, but will only operate at the rated bus frequency or frequency of the slowest adapter in the bus in which it is installed. 64-bit adapters are not supported in slot one.

4. When the NVIDIA Wildcat4 7110 video adapter is installed in the AGP slot, slot one is unavailable due to the width of the adapter.

Models 29U, 36U and 37U do not support 64-bit or PCI-X adapters in slot one due to interference caused by the Firewire adapter.

5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multimode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized.

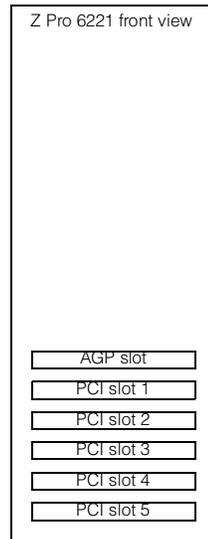
6. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.

7. ATA133 RAID Controller (P/N 71P8592) supports RAID levels 0, 1 and 10 on up to four ATA66, 100 or 133 EIDE HDDs (only four IDE devices can be installed). The dual channel IDE controller includes two internal 40-pin connectors, two 18-inch single-drop IDE cables (P/N 02R0719) and two 23-inch two-drop IDE cables (P/N 02R0721).

8. The integrated copper 10/100/1000Mbps Broadcom (BCM5703) single-port Ethernet controller supports Wake on LAN.

9. Wake on LAN is supported through this adapter if proper shut-down procedures were followed.

10. IntelliStation Z Pro 6221 includes four USB ports (two each on front and rear of the chassis), two nine-pin serial ports, one 25-pin parallel port, audio in/out jacks and a microphone in jack. An integrated IEEE 1394 Firewire digital multimedia port is provided in models that support SCSI HDDs (slot one in these models is not available for 64-bit or PCI-X adapters).



Slot 1: Bus C, 32-bit, 33MHz, 5v, half-length  
 Slot 2: Bus A, 64-bit, 100MHz, 3.3v, full-length, PCI-X  
 Slot 3: Bus A, 64-bit, 100MHz, 3.3v, full-length, PCI-X  
 Slot 4: Bus B, 64-bit, 100MHz, 3.3v, full-length extended, PCI-X  
 Slot 5: Bus B, 64-bit, 100MHz, 3.3v, full-length, PCI-X

**IntelliStation Z Pro 6221 Power, Monitors & Accessories**

Part Number	Description
<b>Power</b>	
IntelliStation Z Pro 6221 includes a 425w voltage-sensing power supply and a single line cord.	
<b>Tower Uninterruptible Power Supply (UPS)</b>	
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
<b>Rack-mount Uninterruptible Power Supply (UPS)</b>	
32P1020	APC 2U Smart-UPS 1400RMB
<b>Monitors<sup>1</sup></b>	
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black
6652U3N	P275 Color Monitor 21in (503mm, 19.8in viewable image), stealth black
6639U3N	P77 Color Monitor 17in (406mm, 16in viewable image), stealth black
6651U3N	P97 Color Monitor 19in (457.3mm, 18in viewable image), stealth black
6656HG2	T560 Hybrid Flat Panel Monitor 15in (381mm, 15in viewable image), stealth black
9494HB0	T860 Hybrid Flat Panel Monitor 18.1in (460mm, 18.1in viewable image), stealth black
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black
9503DG3	T221 Flat Panel Monitor 22.2in (564mm, 22.2in viewable image), stealth black
<b>Conversion Kit</b>	
09N4300	4Ux20D Tower-to-Rack Kit
<b>Keyboard and Mouse<sup>2</sup></b>	
22P5185	Rapid Access III USB Keyboard, stealth black
31P7415	Preferred Pro Full-size Keyboard - 104 Keys (stealth black)
28L3673	Sleek 2-button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black)
33L3252	SpaceBall 3D Input Device

1. Refer to IntelliStation Video Adapter Selection Guide for information regarding video adapter connections.  
 2. IntelliStation Z Pro 6221 ships standard with an IBM 104-key keyboard and three-button mouse.



**IntelliStation Z Pro 6221 Tape Options**

<b>Part Number</b>	<b>Tape Drives</b>	<b>Bays Supported</b>	<b>SCSI Interface (bit)</b>	<b>Form Factor</b>	<b>Termination Included</b>	<b>Ext Tape Enclosures<sup>2</sup></b>
48P7042	20/40GB TR7 Internal IDE Tape Drive <sup>1</sup>	1	-	89mm (3.5in) SL or 133mm (5.25in) HH	-	-
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	2	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>3</sup>	3510020 <sup>4</sup>
<b>External Tape Enclosures</b>						
3510020	External Half-High SCSI Storage Enclosure <sup>5</sup>	-	16 LVD	Desktop	N	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext	Y	3510020
24P7929	Enabling Cable for External Ultra320 SCSI Port	-	16 LVD	Int	N	-

Note:

All models include an integrated Ultra320 SCSI controller. SCSI models include a three-drop multimode terminated LVD SCSI cable. IDE models include two two-drop IDE cables. To enable external attachment to channel B of the integrated SCSI controller, optional Enabling Cable for External Ultra320 SCSI Port (P/N 24P7929) is required, which provides a 68-pin HD external connector. All SCSI tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646), which includes a five-drop multimode terminated LVD SCSI cable and an external 0.8mm VHDCI connector. SCSI tape drives installed internally can be connected to channel A of the integrated controller using the cable that ships with the tape drive if the HDDs or hot-swap backplane are attached to ServeRAID-4Lx.

1. SCSI models include a two-drop IDE cable for attachment to the CD-ROM and an IDE tape drive. IDE models include two two-drop IDE cables.
2. To determine external cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
3. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
5. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.





# IBM xSeries 205

## EMEA Part Number Cross Reference

xSeries 205 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
P022Xxx	848022X	8480-22X	P4 2.0GHz/400MHz, 512KB, 256MB, 18.2GB U160, Tower	---
P023Xxx	848023X	8480-23X	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, Tower	---
P02AXxx	84802AX	8480-2AX	P4 2.0GHz/400MHz, 512KB, 256MB, Open Bay U160, Tower	---
P032Xxx	848032X	8480-32X	P4 2.4GHz/533MHz, 512KB, 256MB, 36.4GB U160, Tower	---
P033Xxx	848033X	8480-33X	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Tower	---
P03AXxx	84803AX	8480-3AX	P4 2.4GHz/533MHz, 512KB, 256MB, Open Bay U160, Tower	---
P042Xxx	848042X	8480-42X	P4 2.67GHz/533MHz, 512KB, 256MB, 36.4GB U160, Tower	---
P043Xxx	848043X	8480-43X	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, Tower	---
P04AXxx	84804AX	8480-4AX	P4 2.67GHz/533MHz, 512KB, 256MB, Open Bay U160, Tower	---
P052Xxx	848052X	8480-52X	P4 2.8GHz/533MHz, 512KB, 256MB, 36.4GB U160, Tower	---
P053Xxx	848053X	8480-53X	P4 2.8GHz/533MHz, 512KB, 256MB, 40GB EIDE, Tower	---
P05AXxx	84805AX	8480-5AX	P4 2.8GHz/533MHz, 512KB, 256MB, Open Bay U160, Tower	---
P093Xxx	848093X	8480-93X	Celeron 1.8GHz/400MHz, 128KB, 256MB, 40GB EIDE, Tower	---
P094Xxx	848094X	8480-94X	Celeron 1.8GHz/400MHz, 128KB, 128MB, 40GB EIDE, Tower	---

xSeries 205 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---

Notes 1&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included as indicated.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.

xSeries 205 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
09N75xx	09N7585	---	Remote Supervisor Adapter	---

Note 3

- Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA..

# IBM xSeries 205

## EMEA Part Number Cross Reference

Note 4

xSeries 205 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE	
SUP072Y	94G3134	---	APC Smart-UPS 700	---	
SUP102Y	94G3135	---	APC Smart-UPS 1000	---	
SUP142Y	94G3136	---	APC Smart-UPS 1400	---	
Note 5	32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 6	32P1681	2130R30	---	UPS3000XLV	---
Note 7	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

4. The xSeries 205 ships with a standard country power cord. If conversion to Rack format is being carried out, Rack Power Cable P/N 94G7448 must be ordered, if connection to a high voltage UPS or PDU is required..

5. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

6. Only available in Saudi Arabia.

7. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

Note 8

xSeries 205 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 8	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 8	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 8	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 8	T12ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---
Note 8	T4HB0xx	9494HB0	9494-HB0	T860 18.1" Hybrid Flat Panel Color Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

8. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

Note 9

Note 10

Note 11

Note 12

xSeries 205 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 9	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 10	10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
Note 11	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
Note 12	31P74xx	31P7415	---	IBM Preferred Pro Full-size Keyboard - 104 keys	---
	28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

9. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portuguese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

10. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

11. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

12. Where 'xx' represents a specific country code as follows:- 16=Arabia, 17=Belg/Fre, 18=Belg/UK, 19=Bulgaria, 21=Czech Republic, P/N 31P8767=Czech/US, 22=Denmark, 23=Netherlands, 24=France, 27=Germany, 28=Greece, 29=Israel, 30=Hungary, 31=Iceland, 32=Italy, P/N 31P8250=Italian 141, 36=Norway, 37=Poland, 38=Portugal, 39=Romania, 40=Russia, 41=Rus/Cyrillic, 42=Serb/Cyrillic, 43=Slovak, 44=Spanish, 45=Sweden/Finland, 46=Switzerland, 48=Turkey 440, 49=Turkey 179, 50=UK English, 51=US/Euro, 52=Yugoslavia/La

xSeries 205 Tape Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
	10L7440	3510020	---	External Half High SCSI Storage Enclosure	---



# IBM xSeries 205

Part Number<sup>1</sup>    Withdrawal Date<sup>11</sup>    Processor Speed (GHz)    Number of Processors (Std/Max)    L2 ECC Cache (KB)    Memory (Std/Max)    Form Factor    Power Supply Quantity (Std/Max)    Hot-Swap (Power, Slots, HDD, Fans)    Redundancy (Optional, Standard)    Act System Management Processor    Onboard Ethernet (Mbps)<sup>5</sup>    Storage Controller (Dual, Ultra, RAID)    Removable Media Bays (Total/Avail)    Internal HDD Storage (Std/Max)    CD-ROM (IDE)<sup>9</sup>    Bays (Total/Avail)    Slots (Total/Avail)

xSeries 205 At-A-Glance																	
8480-22X	-	2 <sup>2</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	U160 <sup>6</sup>	3/1	18.2GB/ 587.2GB <sup>7</sup>	48x-20x	7/4	5/5
8480-23X	-	2 <sup>2</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	IDE	3/1	40GB/240GB <sup>8</sup>	48x-20x	7/4	5/5
8480-2AX	-	2 <sup>2</sup>	1/1	512	256MB/2GB	Tower	1/1	H	-	-	10/100/1000	U160 <sup>6</sup>	3/1	0/367GB <sup>7</sup>	48x-20x	7/5	5/5
8480-32X	-	2.4 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	U160 <sup>6</sup>	3/1	36.4GB/ 587.2GB <sup>7</sup>	48x-20x	7/4	5/5
8480-33X	-	2.4 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	IDE	3/1	40GB/240GB <sup>8</sup>	48x-20x	7/4	5/5
8480-3AX	-	2.4 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	H	-	-	10/100/1000	U160 <sup>6</sup>	3/1	0/367GB <sup>7</sup>	48x-20x	7/5	5/5
8480-42X	-	2.67 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	U160 <sup>6</sup>	3/1	18.2GB/ 587.2GB <sup>7</sup>	48x-20x	7/4	5/5
8480-43X	-	2.67 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	IDE	3/1	40GB/240GB <sup>8</sup>	48x-20x	7/4	5/5
8480-4AX	-	2.67 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	H	-	-	10/100/1000	U160 <sup>6</sup>	3/1	0/367GB <sup>7</sup>	48x-20x	7/5	5/5
8480-52X	-	2.8 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	U160 <sup>6</sup>	3/1	36.4GB/ 587.2GB <sup>7</sup>	48x-20x	7/4	5/5
8480-53X	-	2.8 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	IDE	3/1	40GB/240GB <sup>8</sup>	48x-20x	7/4	5/5
8480-5AX	-	2.8 <sup>3</sup>	1/1	512	256MB/2GB	Tower	1/1	H	-	-	10/100/1000	U160 <sup>6</sup>	3/1	0/367GB <sup>7</sup>	48x-20x	7/5	5/5
8480-93X <sup>10</sup>	25-Mar	1.8 <sup>4</sup>	1/1	128	256MB/2GB	Tower	1/1	-	-	-	10/100/1000	IDE	3/1	40GB/240GB <sup>8</sup>	48x-20x	7/4	5/5
8480-94X <sup>10</sup>	-	1.8 <sup>4</sup>	1/1	128	128MB/2GB	Tower	1/1	-	-	-	10/100/1000	IDE	3/1	40GB/240GB <sup>8</sup>	48x-20x	7/4	5/5

1. Ships with standard keyboard and mouse. See Power, Monitors and Accessories section for tower-to-rack conversion kit.  
2. Intel Pentium 4 processor with advanced transfer L2 cache and 400MHz (quad-pumped) Front-side Bus (FSB).  
3. Intel Pentium 4 processor with advanced transfer L2 cache and 533MHz (quad-pumped) FSB.  
4. Intel Celeron 1.8GHz processor with 128KB L2 cache and 400MHz (quad-pumped) FSB.  
5. Broadcom 5702 integrated gigabit Ethernet controller.  
6. Integrated single channel Ultra 160 SCSI storage controller.  
7. Maximum capacity for nonhot-swap models is based on four 146.8GB SCSI HDDs. Maximum capacity for hot-swap models is based on three 73.4GB hot-swap SCSI HDDs and one 146.8GB nonhot-swap SCSI HDD.  
8. Maximum capacity is based on three 80GB IDE HDDs.  
9. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.  
10. This VL (value line) model includes a one-year on-site and labor limited warranty.  
11. Not available from IBM after this date. Business Partner inventory may be available.

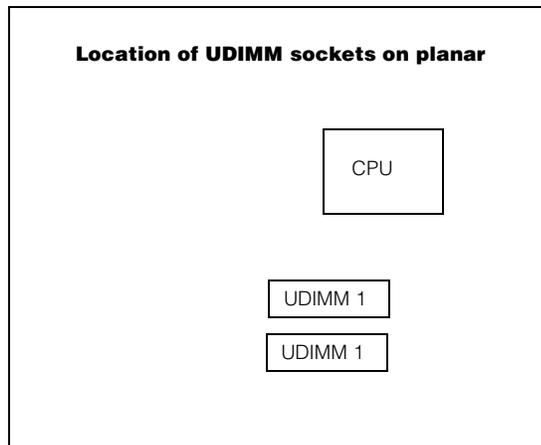
## xSeries 205 Memory

Part Number	Memory Description
10K0067	256MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0069	512MB PC2100 CL2.5 ECC DDR SDRAM UDIMM
10K0071	1GB PC2100 CL2.5 ECC DDR SDRAM UDIMM

Total System Memory <sup>1</sup>	Quantity of UDIMMs Added		
	256MB (10K0067)	512MB (10K0069)	1GB (10K0071)
512MB	1	-	-
768MB	-	1	-
1GB <sup>2</sup>	-	2	-
1.25GB	-	-	1
1.5GB <sup>2</sup>	-	1	1
2GB <sup>2</sup>	-	-	2

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller UDIMMs may provide a more cost-effective alternative to using larger UDIMMs.

1. Select the desired total memory, then add the selection in that row to the standard memory.
2. Requires removal of standard UDIMM.



## xSeries 205 Internal SCSI Cabling

### EIDE Configurations

xSeries 205 EIDE models include two two-drop IDE cables. One cable is used to attach to the standard CD-ROM drive. The other attaches to the standard 40GB IDE HDD. Two additional IDE devices may be installed (up to two IDE HDDs or one optical drive and an IDE HDD).

### SCSI Configurations

xSeries 205 supports both nonhot-swap and hot-swap SCSI configurations. Both hot-swap and nonhot-swap models include a standard integrated single-channel Ultra160 SCSI controller and a two-drop IDE cable for connection to the standard CD-ROM drive and one other IDE optical drive (optional). Nonhot-swap models include a five-drop 16-bit LVD terminated SCSI cable for connection of SCSI HDDs and an optional SCSI tape drive. Hot-swap models include a nonterminated SCSI cable for connecting the integrated controller to the hot-swap backplane. Support for tape drives on the same SCSI bus as the hot-swap backplane is not provided. If the optional ServeRAID-4Mx or -4Lx controller is installed, the standard cable is used to connect the HDDs in nonhot-swap models or the backplane in hot-swap models to the RAID controller. Tape drives are then connected to the integrated controller using the terminated SCSI cable provided with the optional tape drive. External SCSI connections require a supported SCSI controller.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**



**xSeries 205 Hard Disk Drive (HDD)**

<b>SCSI Models</b>						
<b>Total Internal Storage<sup>1</sup></b>	<b>10,000rpm HDDs</b>				<b>15,000rpm HDDs</b>	
	<b>18.2GB (06P5750, 06P5754)<sup>2</sup></b>	<b>36.4GB (06P5751, 06P5755, 32P0723)<sup>2</sup></b>	<b>73.4GB (06P5752, 06P5756), 32P0724)<sup>2</sup></b>	<b>146.8GB (32P0725)<sup>2</sup></b>	<b>18.2GB (06P5765, 06P5767)<sup>2</sup></b>	<b>36.4GB (06P5766, 06P5768)<sup>2</sup></b>
0GB	Standard on some base models <sup>3</sup>					
18.2GB	1	-	-	-	1	-
36.4GB	2	1	-	-	2	1
54.6GB	3	-	-	-	3	-
72.8GB	4 <sup>4</sup>	2	-	-	4 <sup>4</sup>	2
109.2GB	-	3	-	-	-	3
145.6GB	-	4 <sup>4</sup>	-	-	-	4 <sup>4</sup>
146.8GB	-	-	2	1	-	-
220.2GB	-	-	3	-	-	-
293.6GB	-	-	4 <sup>4</sup>	2	-	-
440.4GB	-	-	-	3	-	-
587.2GB	-	-	-	4 <sup>4</sup>	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. Both hot-swap and nonhot-swap HDDs are listed. Select the appropriate part number for the model of xSeries 205 being configured.
3. Nonhot-swap SCSI models ship standard with either one 18.2GB or one 36.4GB Ultra160 SCSI HDD.
4. Only three hot-swap HDDs are supported in hot-swap models. A nonhot-swap HDD installed in bay four and connected to the same SCSI bus as the hot-swap backplane is not supported.

<b>EIDE Models</b>			
<b>Total Internal Storage<sup>1</sup></b>	<b>7200rpm HDDs<sup>2</sup></b>		
	<b>40GB (22P7157)</b>	<b>60GB (09N4207)</b>	<b>80GB (09N4226)</b>
40GB	(Std on IDE models)	-	-
80GB	1	-	-
100GB	-	1	-
120GB	-	-	1
140GB	1	1	-
160GB	1	-	1
180GB	-	1	1
200GB	-	-	2
240GB <sup>3</sup>	-	-	3

This table does not represent all possible HDD configurations. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

1. Select a total storage row then add the quantity of HDDs from all columns to the standard HDD.
2. The two EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, HDDs and IDE tape drives.
3. Requires removal of the standard HDD.



Part Number	Description	RPM	Height	Hot-swap Models		Nonhot-swap Models	
				Bays Supported <sup>3</sup>	Maximum Quantity	Bays Supported	Maximum Quantity
<b>IDE HDDs<sup>1</sup></b>							
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	-	-	4 ... 7	3
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	-	-	4 ... 7	3
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	-	-	4 ... 7	3
<b>Nonhot-swap Ultra160 SCSI HDDs<sup>2</sup></b>							
06P5750	18.2GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4	1	4 ... 7	4
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4	1	4 ... 7	4
06P5752	73.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	4	1	4 ... 7	4
06P5765	18.2GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	4	1	4 ... 7	4
06P5766	36.4GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	4	1	4 ... 7	4
<b>Nonhot-swap Ultra320 HDDs<sup>2, 3</sup></b>							
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	4	1	4 ... 7	4
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	4	1	4 ... 7	4
32P0725	146.8GB 10Krpm Ultra320 SCSI HDD	10000	SL	4	1	4 ... 7	4
<b>Hot-swap Ultra160 SCSI HDDs<sup>4</sup></b>							
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	5 ... 7	3	-	-
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	5 ... 7	3	-	-
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	5 ... 7	3	-	-
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	5 ... 7	3	-	-
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	5 ... 7	3	-	-
<b>Optical Devices</b>			<b>Bays Supported</b>				
22P6950	16x Max RAM-Read DVD-ROM Drive <sup>5, 6</sup>			1, 2			
10K3782	48x-20x CD-ROM Black Internal IDE Drive <sup>5</sup>			1, 2			
22P6970	Multi-Burner <sup>5, 6</sup>			1, 2			
22P6973	32x-10x-40x-16x Max CD-RW/DVD-ROM Combination Drive <sup>5, 6</sup>			1, 2			
<b>External Storage Expansion Units<sup>7</sup></b>			<b>Form Factor</b>				
35311RU	EXP300 Storage Expansion Unit <sup>8</sup>			Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit			-			

1. The xSeries 205 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, hard disk drives and IDE tape drives.

2. Nonhot-swap HDDs are supported in bays 4 ... 7 of nonhot-swap models and in bay four of hot-swap models. Nonhot-swap HDDs are not supported on the same SCSI bus as the hot-swap backplane in hot-swap models.

3. Ultra320 HDDs are supported, but performance is limited to the Ultra 160 speed of the SCSI controller.

4. Hot-swap HDDs are supported in bays 5 ... 7 of hot-swap models. Bay four supports nonhot-swap HDDs only. Nonhot-swap HDDs are not supported on the same SCSI bus as the hot-swap backplane in hot-swap models.

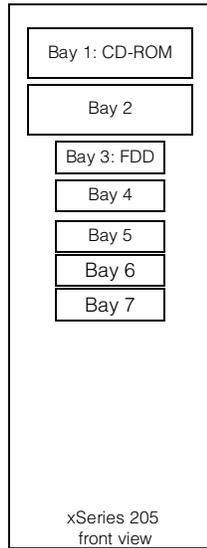
5. Either replace the standard CD-ROM or install in the available media bay. An IDE cable with three connectors is included with the optional optical drive (same cable is standard in the system). If installing as an additional device, connect the cable to each optical device and the IDE connector on the system board. Configure the optional device as a master using the preset configuration if replacing the standard device or as a slave if installed as a redundant device.

6. Audio not supported for DVD-ROM drives. The drive provides data input/output only.

7. Not supported by the onboard SCSI controller. Select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.

8. EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.

IBM xSeries 205

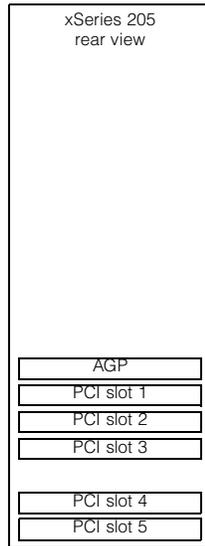


Bay	Form Factor	Height	Front Access	Usage
1	133mm (5.25in)	HH	yes	CD-ROM
2	133mm (5.25in)	HH	yes	open <sup>1</sup>
3	89mm (3.5in)	SL	yes	FDD
4	89mm (3.5in)	SL	yes	open
5 ... 7 <sup>2</sup>	89mm (3.5in)	SL	yes	open

Note: HDDs are installed in the order of bays seven through four, i.e., 7, 6, 5, 4.

1. Supports removable media devices only. Hard disk drives are not supported.
2. Bays five, six and seven are configured as hot-swap bays on xAX models. These bays are not front-accessible in nonhot-swap models.

### xSeries 205 I/O Options



All PCI slots are 33MHz, 32-bit, full-length on a single PCI bus supporting 5v or universal adapters.



Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>2</sup>
<b>Storage Controllers<sup>3</sup></b>				
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	1 ... 5
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>5</sup>	Half	64-bit	1 ... 5
71P8592	ATA133 RAID Controller <sup>6</sup>	Half	32-bit	1 ... 5
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>7</sup>	Half	32-bit	1 ... 5
<b>Networking<sup>8</sup></b>				
<b>Ethernet<sup>9</sup></b>				
06P3601	10/100 Ethernet Server Adapter <sup>10</sup>	Half	32-bit	1 ... 5
22P4901	10/100 Dual Port Server Adapter <sup>10</sup>	Half	64-bit	1 ... 5
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>10</sup>	Half	64-bit	1 ... 5
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>10</sup>	Half	64-bit	1 ... 5
<b>Token Ring</b>				
34L5001	16/4 Token-ring PCI Management Adapter <sup>10</sup>	Half	32-bit	1 ... 5
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter <sup>10</sup>	Half	32-bit	1 ... 5
<b>System Management</b>				
09N7585	Remote Supervisor Adapter <sup>11</sup>	Half	32-bit	1
<b>Communications<sup>12</sup></b>				

1. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot.
2. The xSeries 205 has five full-length PCI expansion slots on a single 32-bit, 33MHz bus.
3. xSeries 205 has an integrated Ultra160 SCSI Controller with a single internal channel. Nonhot-swap models ship with a five-drop, multimode terminated LVD SCSI cable. Hot-swap models ship with a nonterminated LVD SCSI cable.
4. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connections are 0.8mm VHDCI.
5. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
6. ATA133 RAID Controller (P/N 71P8592) supports RAID levels 0, 1 and 10 on up to four ATA66, 100 or 133 EIDE HDDs (only four IDE devices can be installed). The dual channel IDE controller includes two internal 40-pin connectors, two 18-inch single-drop IDE cables (P/N 02R0719) and two 23-inch two-drop IDE cables (P/N 02R0721).
7. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized.
8. xSeries 205 includes an integrated copper-based Broadcom 5702 full-duplex, 10/100/1000Mbps Ethernet controller.
9. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Three optional Ethernet adapters are copper and intel-based (P/N 06P3601, 22P4901, 22P6801). One is Broadcom-based (P/N 31P6301).
10. Wake on LAN is supported for this option when installed in slots one through five.
11. When installing this option in xSeries 205, the external power supply provided with the option is not required. All power is supplied through the internal 20-pin ribbon cable.
12. xSeries 205 includes two USB ports (on rear of chassis), two 9-pin serial ports, one 25-pin parallel port, AC 97 audio line in/out jacks, and a microphone in jack.



**xSeries 205 Power, Monitors & Accessories**

Part Number	Description
<b>Power<sup>1</sup></b>	
<b>Tower Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
94G3134	APC Smart-UPS 700 <sup>3</sup>
94G3135	APC Smart-UPS 1000 <sup>3</sup>
94G3136	APC Smart-UPS 1400 <sup>3</sup>
<b>Rack Mount Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>4</sup>
2130R31	UPS3000XHV <sup>4</sup>
32P1692	UPS Extend Run Battery Pack <sup>4</sup>
37L6861	APC Smart-UPS 5000RMB <sup>5</sup>
<b>Monitors<sup>6</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>7</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
9512AB1	T541 Flat Panel Color Monitor (381mm, 15in viewable image), stealth black <sup>3</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>
9494HBO	T860 Hybrid Flat Panel Monitor 18.1in (460mm, 18.1in viewable image), stealth black <sup>3</sup>

1. The xSeries 205 includes a 340w voltage sensing power supply with a single line cord.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Not supported for rack mounting.
4. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.
5. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.
6. The xSeries 205 contains an ATI Rage XL video controller with 4MB of video memory.
7. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
8. Includes a 15in Flat Panel Monitor.

Part Number	Description
<b>Conversion Kits</b>	
09N4300	4Ux20D Tower-to-Rack Kit
<b>Rack and NetBAY<sup>1</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>3</sup></b>	
28L3644	Space Saver II Keyboard <sup>4, 5</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>6, 7</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>6, 7</sup>
31P7415	Preferred Pro Full-size Keyboard - 104 Keys (stealth black)
28L3673	Sleek 2-button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>7</sup>

1. Rack installation of an xSeries 205 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed in the Rack Cabinets and Options section.
2. Refer to the Rack Console Options section for information regarding console connectivity using these options.
3. xSeries 205 models ship standard with both a mouse and nonspace saver keyboard.
4. Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).
5. Advanced TrackPoint IV features are not available on IBM xSeries systems.
6. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
7. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.



### xSeries 205 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures <sup>1</sup>
48P7042	20/40GB TR7 Internal IDE Tape Drive <sup>2</sup>	2, 4	-	89mm (3.5in) SL or 133mm (5.25in) HH	-	-
00N7991	20/40 GB DDS/4 4mm Internal Tape Drive <sup>3</sup>	2	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>4</sup>	3510020 <sup>5</sup>
24P2396	100/200GB LTO Half-High Tape Drive <sup>3, 4, 8</sup>	2	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>4</sup>	3510020 <sup>5</sup>
24P2398	40/80GB Half-High DLTVS Internal SCSI Tape Drive <sup>3, 8</sup>	2	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>4</sup>	3510020 <sup>5</sup>
<b>External Tape Enclosures</b>						
3510020	External Half High SCSI Storage Enclosure <sup>6</sup>	-	16 LVD	Desktop	N	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	3510020

1. To determine external cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2. SCSI models include a two-drop EIDE cable for attachment to the CD-ROM and an IDE tape drive.
3. EIDE models require optional PCI Wide Ultra 160 SCSI Adapter (P/N 19K4646), which includes a five-drop multimode LVD SCSI cable.
4. When installed internally, termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option.
5. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
7. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.
8. Supported only in new builds of External Half-High SCSI Storage Enclosure (P/N 3510020), indicated by AI Header J1PJK on the outside box label of the tape enclosure.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

### xSeries 205 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

#### File and Print Server

Part Number	Description	Quantity
8480-22X	xSeries 205 2GHz/400MHz-512KB Pentium 4, 256MB ECC, 18.2GB, 48x	1
10K0069	512MB PC2100 CL2.5 ECC DDR SDRAM UDIMM	1 <sup>1</sup>
06P5750	18.2GB 10Krpm Ultra 160 SCSI SL HDD	3 <sup>2</sup>
24P2396	100/200GB LTO Half-High Tape Drive	1
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 768MB of system memory.
2. For a total of 72.8GB of internal storage.

#### Application Server

Part Number	Description	Quantity
8480-3AX	xSeries 205 2.4GHz/533MHz-512KB Pentium 4, 256MB ECC, open hot-swap, 48x	1
10K0069	512MB PC2100 CL2.5 ECC DDR SDRAM UDIMM	1 <sup>1</sup>
06P5754	18.2 GB 10Krpm Ultra 160 SCSI Hot-swap SL HDD	3 <sup>2</sup>
06P5740	ServeRAID-4Lx Ultra 160 SCSI Controller	1
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	1
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 768MB of system memory.
2. Three HDDs are used for RAID 5 protection. Effective capacity is two HDDs or 36.4GB.



# IBM xSeries 225

## EMEA Part Number Cross Reference

xSeries 225 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
P722Xxx	864722X	8647-22G	Xeon 2.0GHz/400MHz, 512KB, 256MB, 36.4GB U320, Tower	---
P72AXxx	86472AX	8647-2AX	Xeon 2.0GHz/400MHz, 512KB, 512MB, Open Bay HS, Tower	---
P732Xxx	864732X	8647-32G	Xeon 2.4GHz/533MHz, 512KB, 256MB, 36.4GB U320, Tower	---
P73AXxx	86473AX	8647-3AX	Xeon 2.4GHz/533MHz, 512KB, 512MB, Open Bay HS, Tower	---
P73BXxx	86473BX	8647-3BX	Xeon 2.4GHz/533MHz, 512KB, 512MB, Open Bay HS, Redundant Power, Tower	---
P742Xxx	864742X	8647-42G	Xeon 2.67GHz/533MHz, 512KB, 256MB, 36.4GB U320, Tower	---
P74AXxx	86474AX	8647-4AX	Xeon 2.67GHz/533MHz, 512KB, 512MB, Open Bay HS, Tower	---
P74BXxx	86474BX	8647-4BX	Xeon 2.67GHz/533MHz, 512KB, 512MB, Open Bay HS, Redundant Power, Tower	---
P752Xxx	864752X	8647-52G	Xeon 2.8GHz/533MHz, 512KB, 256MB, 36.4GB U320, Tower	---
P75AXxx	86475AX	8647-5AX	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay HS, Tower	---
P75BXxx	86475BX	8647-5BX	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay HS, Redundant Power, Tower	---

xSeries 225 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2  
Notes 6&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included as indicated.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 225 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	33L4618	---	V90 PCI Data/Fax WinModem	N/A
37L14xx	37L14xx	---	Serial I/O SST 8 and 16 port Adapters	Note 3
09N75xx	09N7585	---	Remote Supervisor Adapter	---

Note 7  
Note 8

- Serial I/O Adapter P/Ns 37L1414 and 37L1415 are available. Other Serial I/O adapter part numbers are withdrawn from marketing in EMEA.
- Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA..

# IBM xSeries 225

## EMEA Part Number Cross Reference

Note 9

xSeries 225 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE	
SUP072Y	94G3134	---	APC Smart-UPS 700	---	
SUP102Y	94G3135	---	APC Smart-UPS 1000	---	
SUP142Y	94G3136	---	APC Smart-UPS 1400	---	
Note 10	32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 11	32P1681	2130R30	---	UPS3000XLV	---
Note 12	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

9. The xSeries 225 ships with one or two standard country power cords. If conversion to Rack format is being carried out, Rack Power Cable P/N 94G7448 must be ordered, if connection to a high voltage UPS or PDU is required.

10. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

11. Only available in Saudi Arabia.

12. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

Note 13

xSeries 225 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 13	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 13	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 13	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 13	T12ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

13. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

Note 14

xSeries 225 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 14	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 15	10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
Note 16	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
	28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

14. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

15. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

16. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

Note 17

xSeries 225 Tape Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
Note 17	00N79xx	360716X	---	3607 Series 1760GB/3.5TB SDLT pro Tape Autoloader	---
Note 18	59P67xx	0034B0X	---	NetBAY Tape Enclosure (4U Rack mount)	---
	10L7440	3510020	---	External Half High SCSI Storage Enclosure	---

17. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

18. Where 'xx' represents a country specific power cord code: 26=UK, 27=EU1, 28=Denmark, 29=India/South Africa, 30=Swiss, 33=Italy, 31=Israel



# IBM xSeries 225

Part Number<sup>1</sup> Processor Speed (GHz) Number of Processors (Std/Max)<sup>2</sup> L2 ECC Cache (KB) Memory (Std/Max)<sup>4</sup> Form Factor Power Supply Quantity (Std/Max) Hot-Swap (Power, Slots, HDD, Fans) Redundancy (Optional, Standard)<sup>5</sup> System Management Processor Onboard Ethernet (Mbps)<sup>6</sup> SCSI Controller (Dual, Ultra, RAID)<sup>7</sup> Removable Media Bays (Total/Avail)<sup>8</sup> Internal HDD Storage (Std/Max)<sup>9</sup> CD-ROM (IDE)<sup>9</sup> Bays (Total/Avail) Slots (Total/Avail)<sup>10</sup>

xSeries 225 At-A-Glance																
8647-22X	2 <sup>2</sup>	1/2	512	256MB/8GB	Tower	1/1	-	-	N	10/100/1000	D, U320	3/1	36.4GB/587.2GB	48x-20x	7/4	5/5
8647-2AX	2 <sup>2</sup>	1/2	512	512MB/8GB	Tower	1/1	H	-	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5
8647-32X	2.4 <sup>3</sup>	1/2	512	256MB/8GB	Tower	1/1	-	-	N	10/100/1000	D, U320	3/1	36.4GB/587.2GB	48x-20x	7/4	5/5
8647-3AX	2.4 <sup>3</sup>	1/2	512	512MB/8GB	Tower	1/1	H	-	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5
8647-3BX	2.4 <sup>3</sup>	1/2	512	512MB/8GB	Tower	2/2	P, H	S-Power	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5
8647-42X	2.67 <sup>3</sup>	1/2	512	256MB/8GB	Tower	1/1	-	-	N	10/100/1000	D, U320	3/1	36.4GB/587.2GB	48x-20x	7/4	5/5
8647-4AX	2.67 <sup>3</sup>	1/2	512	512MB/8GB	Tower	1/1	H	-	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5
8647-4BX	2.67 <sup>3</sup>	1/2	512	512MB/8GB	Tower	2/2	P, H	S-Power	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5
8647-52X	2.8 <sup>3</sup>	1/2	512	256MB/8GB	Tower	1/1	-	-	N	10/100/1000	D, U320	3/1	36.4GB/587.2GB	48x-20x	7/4	5/5
8647-5AX	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Tower	1/1	H	-	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5
8647-5BX	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Tower	2/2	P, H	S-Power	N	10/100/1000	D, U320	3/1	0/880.8GB	48x-20x	9/7	5/5

1. Ships with standard keyboard and mouse. See Power, Monitors and Accessories section for tower-to-rack conversion kit.  
 2. Intel Xeon processor with advanced transfer L2 cache and 400MHz (quad-pumped) access to memory and I/O buses.  
 3. Intel Xeon processor with advanced transfer L2 cache and 533MHz (quad-pumped) access to memory and I/O buses.  
 4. High-speed, two-way interleaved 133MHz DDR PC2100 RDIMM. Maximum capacity includes four 2GB RDIMMs, requiring replacement of the two standard RDIMMs.  
 5. Some models include a single 425w nonhot-swap power supply. Redundant power models include two 350w hot-swap power supplies, each with its own power cord, providing N+N redundancy.  
 6. A Broadcom 5703 copper gigabit Ethernet controller is integrated into the planar.  
 7. The dual-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed. One additional HDD may be designated as a hot-spare for HDDs configured in the onboard mirror. Mirrored and hot-spare HDDs must be matched.  
 8. Maximum storage capacity is based on four 146.8GB nonhot-swap Ultra320 HDDs in nonhot-swap models and six 146.8GB hot-swap Ultra320 HDDs in hot-swap models. Nonhot-swap models include a terminated LVD four-drop SCSI cable and hot-swap models include a single-drop nonterminated LVD SCSI cable.  
 9. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.  
 10. Nonhot-swap models include seven total bays and hot-swap models include nine bays.

### xSeries 225 Processors

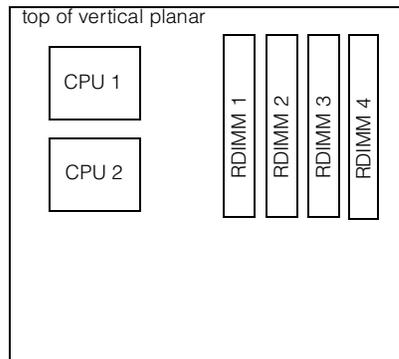
Part Number	Processor Upgrades	SMP Support <sup>1</sup>
59P5112	2GHz/400MHz-512KB L2 Cache Upgrade with Xeon Processor	2xX
59P5108	2.4BGHz/533MHz-512KB L2 Cache Upgrade with Xeon Processor	3xX
24P7861	2.67GHz/533MHz-512KB L2 Cache Upgrade with Xeon Processor	4xX
24P8054	2.8GHz/533MHz-512KB L2 Cache Upgrade with Xeon Processor	5xX

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed and cache size.

### xSeries 225 Memory

Part Number	Memory Description <sup>1</sup>
33L5036	128MB DDR PC2100 ECC RDIMM
33L5037	256MB DDR PC2100 ECC RDIMM
33L5038	512MB DDR PC2100 ECC RDIMM
33L5039	1GB DDR PC2100 ECC RDIMM
33L5040	2GB PC2100 CL2.5 ECC DDR SDRAM RDIMM

1. Due to two-way interleaving, installation of memory options in matched pairs beginning with RDIMMs three and four is required. Standard RDIMMs are installed in sockets three and four.



Total System Memory <sup>1</sup>		Quantity of RDIMMs Added				
256MB (2 x 128) Models	512MB (2 x 256) Models	128MB (33L5036)	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)	2GB (33L5040)
512MB	768MB	2	-	-	-	-
768MB	1GB	-	2	-	-	-
1.25GB	1.5GB	-	-	2	-	-
2.25GB	2.5GB	-	-	-	2	-
4.25GB	4GB	-	-	-	-	2
5GB <sup>2</sup>	5GB <sup>2</sup>	-	-	2	-	2
6GB <sup>2</sup>	6GB <sup>2</sup>	-	-	-	2	2
8GB <sup>2</sup>	8GB <sup>2</sup>	-	-	-	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.

2. Requires replacing the standard RDIMM.



## xSeries 225 Internal SCSI Cabling

xSeries 225 nonhot-swap models are cabled internally with a four-drop, 16-bit wide Ultra320 SCSI cable with a built-in active terminator at one end of the cable. The other end of the cable is attached to the internal 68-pin connector of channel A of the integrated Ultra320 SCSI controller. SCSI HDDs can be connected to any of the four cable connectors.

xSeries 225 hot-swap models are cabled internally with a single-drop, nonterminated 16-bit wide Ultra320 SCSI cable. One end is connected to the internal 68-pin connector of channel A of the integrated Ultra320 SCSI controller and the other end to the hot-swap backplane, which provides termination for the SCSI bus.

### RAID Configurations

Optional Ultra160 ServeRAID-4Lx, -4Mx or -4H can be used to support HDDs installed in either nonhot-swap or hot-swap models of xSeries 225. In either installation, the standard SCSI cable is removed from the integrated Ultra320 SCSI controller and connected to an internal connector of the RAID controller. An internal SCSI tape drive can be attached to channel A of the integrated Ultra320 controller when the HDDs are attached to a ServeRAID-4x adapter. If ServeRAID-5i is installed, cabling remains connected and both channels of the integrated controller are managed by the optional adapter. Channel B can be attached to an internal SCSI device if ServeRAID-5i is configured to support a SCSI bus.

### Configuration Alternatives

Optional External SCSI Interface Kit (32P8164) can be installed to enable a 0.8mm VHDCI external connector. Support for external tape drives is limited to half-high LVD SCSI tape drives if the integrated controller is managed by ServeRAID-5i. External SCSI support can be obtained by installing an optional SCSI adapter to support external tape storage, or a RAID controller can be installed to support external SCSI HDD storage.

In addition to the SCSI controller, an IDE controller provides the interface for the IDE CD-ROM drive. A two-drop IDE cable connects the IDE controller to the IDE CD-ROM. The second drop can be used to connect a second optional IDE device.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**

## xSeries 225 Hard Disk Drive (HDD) Storage

Nonhot-swap SCSI models							
Total Internal Storage <sup>1</sup>	10,000rpm SCSI HDDs				15,000rpm SCSI HDDs		
	18.2GB (06P5750)	36.4GB (06P5751, 32P0723) <sup>2</sup>	73.4GB (06P5752, 32P0724) <sup>2</sup>	146.8GB (32P0725)	18.2GB (06P5765)	36.4GB (32P0784, 06P5766) <sup>2</sup>	73.4GB (32P0785)
36.4GB	Standard on nonhot-swap models						
54.6GB	1	-	-	-	1	-	-
72.8GB	2	1	-	-	2	1	-
91GB	3	-	-	-	3	-	-
109.2GB	-	2	-	-	-	2	-
145.6GB	-	3	-	-	-	3	-
183.2GB	-	-	2	1	-	-	2
256.6GB	-	-	3	-	-	-	3
293.6GB <sup>3</sup>	-	-	4	2	-	-	4
476.8GB	-	-	-	3	-	-	-
587.2GB (max) <sup>3</sup>	-	-	-	4	-	-	-

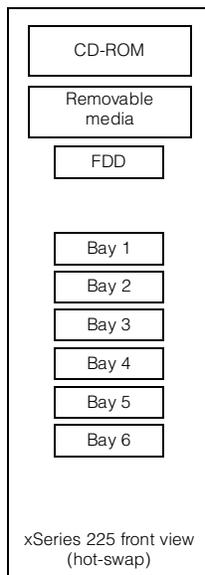
This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. Both Ultra160 and Ultra320 HDDs are included. The integrated Ultra320 SCSI controller supports both speeds, but the bus is limited to the lower rated performance if mixed.
3. Requires removing the standard 36.4GB HDD.

Hot-swap SCSI models							
Total Internal Storage <sup>1</sup>	10,000rpm SCSI HDDs				15,000rpm SCSI HDDs		
	18.2GB (06P5754)	36.4GB (06P5755, 32P0726) <sup>2</sup>	73.4GB (06P5756, 32P0727) <sup>2</sup>	146.8GB (32P0728)	18.2GB (06P5767)	36.4GB (32P0734, 06P5768, 06P5776) <sup>2</sup>	73.4GB (32P0735)
0GB	Standard on base models						
18.2GB	1	-	-	-	1	-	-
36.4GB	2	1	-	-	2	1	-
54.6GB	3	-	-	-	3	-	-
72.8GB	4	2	-	-	4	2	-
91GB	5	-	-	-	5	-	-
109.2GB	6	3	-	-	6	3	-
146.8GB	-	-	2	1	-	-	2
220.2GB	-	-	3	-	-	-	3
293.6GB	-	-	4	2	-	-	4
367GB	-	-	5	-	-	-	5
440.4GB	-	-	6	3	-	-	6
587.2GB	-	-	-	4	-	-	-
734GB	-	-	-	5	-	-	-
880.8GB	-	-	-	6	-	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

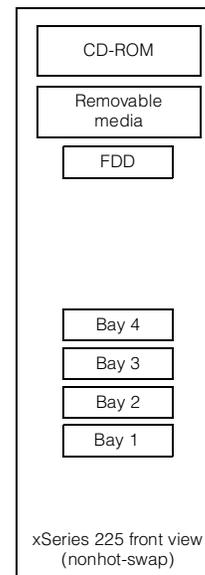
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. Both Ultra160 and Ultra320 HDDs are included. The integrated Ultra320 SCSI controller supports both speeds, but the bus is limited to the lower rated performance if mixed.



Bay	Form Factor	Height	Front Access	Usage
A	133mm (5.25in)	HH	yes	CD-ROM
B	133mm (5.25in)	HH	yes	open <sup>1</sup>
C	89mm (3.5in)	SL	yes	FDD
1 ... 6	89mm (3.5in)	SL	yes	open

Note: HDDs are installed in the order of bays six through one. The boot disk must be installed in bay six.

1. Supports removable media devices only. Hard disk drives are not supported.



Bay	Form Factor	Height	Front Access	Usage
A	133mm (5.25in)	HH	yes	CD-ROM
B	133mm (5.25in)	HH	yes	open <sup>1</sup>
C	89mm (3.5in)	SL	yes	FDD
2 ... 4	89mm (3.5in)	SL	no	open <sup>2</sup>
1	89mm (3.5in)	SL	no	HDD <sup>2</sup>

Note: HDDs are installed in the order of bays one through four. The boot disk must be installed in bay one.

1. Supports removable media devices only. Hard disk drives are not supported.
2. HDD bays are not front-accessible in nonhot-swap models.



Part Number	Description	RPM	Height	Hot-swap Models		Nonhot-swap Models	
				Bays Supported	Maximum Quantity	Bays Supported	Maximum Quantity
<b>Nonhot-swap Ultra160 SCSI HDDs<sup>1</sup></b>							
06P5750	18.2GB 10Krpm Ultra 160 SCSI SL HDD	10000	SL	-	-	1 ... 4	4
06P5751	36.4GB 10Krpm Ultra 160 SCSI SL HDD	10000	SL	-	-	1 ... 4	4
06P5752	73.4GB 10Krpm Ultra 160 SCSI SL HDD	10000	SL	-	-	1 ... 4	4
06P5765	18.2GB 15Krpm Ultra 160 SCSI SL HDD	15000	SL	-	-	1 ... 4	4
06P5766	36.4GB 15Krpm Ultra 160 SCSI SL HDD	15000	SL	-	-	1 ... 4	4
<b>Nonhot-swap Ultra320 SCSI HDDs<sup>1</sup></b>							
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	-	-	1 ... 4	4
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	-	-	1 ... 4	4
32P0725	146.8GB 10Krpm Ultra320 SCSI HDD	10000	SL	-	-	1 ... 4	4
32P0784	36.4GB 15Krpm Ultra320 SCSI HDD	15000	SL	-	-	1 ... 4	4
32P0785	73.4GB 15Krpm Ultra320 SCSI HDD	15000	SL	-	-	1 ... 4	4
<b>Hot-swap Ultra160 SCSI HDDs<sup>1</sup></b>							
06P5754	18.2GB 10Krpm Ultra 160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6	-	-
06P5755	36.4GB 10Krpm Ultra 160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6	-	-
06P5756	73.4GB 10Krpm Ultra 160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6	-	-
06P5767	18.2GB 15Krpm Ultra 160 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	6	-	-
06P5768	36.4GB 15Krpm Ultra 160 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	6	-	-
<b>Hot-swap Ultra320 SCSI HDDs<sup>1</sup></b>							
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6	-	-
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6	-	-
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6	-	-
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	6	-	-
32P0734	36.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1 ... 6	6	-	-
32P0735	73.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1 ... 6	6	-	-
<b>Associated Options</b>							
32P8164	External SCSI Interface Kit <sup>2</sup>	-		-	1	-	1
<b>Optical Devices</b>				<b>Bays Supported</b>			
10K3782	48x-20x CD-ROM Black Internal IDE Drive <sup>3</sup>			1, 2			
22P6950	16x Max RAM-Read DVD-ROM Drive <sup>3, 4</sup>			1, 2			
<b>External Storage Expansion Units<sup>5</sup></b>				<b>Form Factor</b>			
35311RU	EXP300 Storage Expansion Unit <sup>6</sup>			Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit			-			
17401RU	FAST EXP700 Storage Expansion Unit <sup>7</sup>			Rack (3U)			
35601RU	FAST EXP500 Storage Expansion Unit <sup>8</sup>			Rack (3U)			
35421RU	FAST T200 Storage Server <sup>9, 10</sup>			Rack (3U)			
35422RU	FAST T200 HA Storage Server <sup>9</sup>			Rack (3U)			
19K1121	FAST T200 Redundant RAID Controller			-			

- The integrated Ultra320 SCSI controller supports both Ultra320 and Ultra160 HDDs, but if mixed on the same bus, bus speed is limited to the lower rated performance.
- Required to enable a 0.8mm VHDCI external connector for external SCSI attachment to the second channel of the integrated controller. Refer to Appendix D: Cables - Storage Units - Controllers for additional information.
- Either replace the standard CD-ROM or install in the available media bay. An IDE cable with three connectors is included with the optional optical drive (same cable is standard in the system). If installing as an additional device, connect the cable to each optical device and the IDE connector on the system board. Configure the optional device as a master using the preset configuration if replacing the standard device or as a slave if installed as a redundant device.
- Audio not supported for DVD-ROM drives. The drive provides data input/output only.
- Not supported by the onboard SCSI controller. Select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
- EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required. In order to attach EXP300 to the integrated controller when ServeRAID-5i is installed, External SCSI Interface Kit (P/N 32P8164) is required to enable a 0.8mm VHDCI external connector on the system chassis.
- FAST EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.
- FAST EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350w power supplies, each with its own power cord.
- The FAST T200 includes two hot-swap, 350w auto-ranging redundant power supplies, each with its own power cord.
- Can be upgraded to FAST T200 HA Storage Server through the addition of a FAST T200 Redundant RAID Controller (P/N 19K1121).



## xSeries 225 I/O Options

Part Number	Description	Adapter Length	PCI Support <sup>3</sup>	Slots Supported <sup>1</sup>	Hot-Plug <sup>4</sup>	PCI Voltage	MHz
<b>Storage Controllers<sup>1, 2</sup></b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	2 ... 4	-	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>6</sup>	Full	64-bit	2 ... 4	-	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>7</sup>	Half	64-bit	2 ... 5	-	Universal	66
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>8</sup>	Half	32-bit	1 ... 5	-	Universal	33
25P3492	ServeRAID-5i Controller <sup>9</sup>	Full	64-bit	4	-	Universal	66
<b>Fibre Storage Controllers and Options<sup>10</sup></b>							
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	2 ... 5	-	Universal	133
17421RU	FAST700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FAST500 Storage Server	-	-	-	-	-	-
35421RU	FAST200 Storage Server	-	-	-	-	-	-
35422RU	FAST200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>11</sup>	-	-	-	-	-	-
<b>Networking<sup>12</sup></b>							
<b>Ethernet<sup>13</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>14</sup>	Half	32-bit	1 ... 5	-	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>14</sup>	Half	64-bit	2 ... 5	-	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD <sup>14</sup>	Half	64-bit	2 ... 5	-	Universal	133
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	2 ... 5	-	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>14</sup>	Half	64-bit	2 ... 5	-	Universal	133
<b>Token Ring</b>							
34L5201	High-speed 100/16/4 Token-ring PCI Mgmt Adapter <sup>14</sup>	Half	32-bit	1 ... 5	-	Universal	33
34L5001	16/4 Token-ring PCI Management Adapter <sup>14</sup>	Half	32-bit	1 ... 5	-	Universal	33
<b>Communications<sup>15</sup></b>							
33L4618	V90 PCI Data/Fax Modem <sup>16</sup>	Half	32-bit	1	-	5	33
37L14xx	Serial I/O SST 8- and 16-port adapters <sup>17</sup>	Half	32-bit	1	-	5	33
<b>System Management</b>							
09N7585	Remote Supervisor Adapter <sup>18</sup>	Half	32-bit	1	-	Universal	33

1. The dual-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed. One additional HDD may be designated as a hot-spare for HDDs configured in the onboard mirror. Mirrored and hot-spare HDDs must be matched.
2. xSeries 225 includes a dual-channel Ultra320 SCSI controller with two internal connectors. An external high density 68-pin connector can be enabled using optional External SCSI Interface Kit (P/N 32P8164) to connect channel B to an external SCSI connector. External connection using this option and the external knockout is not supported if both channels of the integrated controller are connected internally, in which case a supported PCI SCSI controller is required to support an external SCSI device.
3. A 32-bit adapter installed into a 64-bit slot will restrict the data transfer rate to 32-bit. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot. 33MHz adapters will reduce 100MHz buses to 33MHz. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers, but will only operate at the rated bus frequency or frequency of the slowest adapter in the bus in which it is installed. 64-bit adapters are not supported in slot one.
4. xSeries 225 does not support hot-plug PCI slots.
5. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache with two internal and four external Ultra160 connectors (a combination of four connectors may be utilized). External connectors are 0.8mm VHDCI.
6. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connections are 0.8mm VHDCI.
7. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multimode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized.
9. ServeRAID-5i (P/N 25P3492) supports both Ultra320 and Ultra160 HDDs in a dedicated or mixed environment. The adapter installs into PCI slot four and converts both channels of the onboard SCSI controller to RAID in conjunction with the LSI 1020/30 chipset. The standard SCSI HDD backplane cables directly to the integrated controller connector. Half-high tape drives can be supported either internally or externally on the second channel of an integrated controller managed by ServeRAID-5i if the bus is designated as SCSI during RAID set-up. Supports up to 528MB/s data transfers across the PCI bus with 128MB ECC SDRAM write-back cache with battery backup. Supports RAID levels 0, 1, 10, 5, 50 and 1E.
10. See Fibre Channel Solutions Overview section for additional configuration information.
11. The 2108R3L SAN Data Gateway Router UltraSCSI LVD Port provides one integrated short-wave optical port and two SCSI ports for tape connections (LVD, HVD and single-ended).
12. The integrated copper 10/100/1000Mbps Broadcom (BCM5703) single-port Ethernet controller supports Wake on LAN.
13. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Three optional adapters are copper and Intel-based (P/N 06P3601, 22P4901, 22P6801). Two are Broadcom-based (22P7801, 31P6301).
14. The Wake on LAN (WoL) function provided by this Ethernet PCI adapter is supported in this system.
15. xSeries 225 includes four USB ports (two each on front and rear of the chassis), two nine-pin serial ports, one 25-pin parallel port, audio in/out jacks and a microphone in jack.
16. Due to homologation variances, modem availability may differ by country.
17. See Appendix E for details on Serial I/O options and configuration limitations.
18. Connect the 20-pin ribbon cable provided with the option between the planar connector and the adapter. RSA provides full system management functionality through a customer-supplied Ethernet cable or modem connection or as part of an interconnected system management bus (option includes all interconnect hardware). The 20-pin ribbon cable connecting RSA to the planar does not meet power requirements. Connection of the external AC power supply provided with RSA is required.



Slot 1: Bus C, 32-bit, 33MHz, 5v, half-length  
 Slot 2: Bus A, 64-bit, 100MHz, 3.3v, full-length, PCI-X  
 Slot 3: Bus A, 64-bit, 100MHz, 3.3v, full-length, PCI-X  
 Slot 4: Bus B, 64-bit, 100MHz, 3.3v, full-length extended, PCI-X  
 Slot 5: Bus B, 64-bit, 100MHz, 3.3v, full-length, PCI-X

**xSeries 225 Power, Monitors & Accessories**

Part Number	Description
<b>Power<sup>1</sup></b>	
<b>Tower Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
94G3134	APC Smart-UPS 700 <sup>3</sup>
94G3135	APC Smart-UPS 1000 <sup>3</sup>
94G3136	APC Smart-UPS 1400 <sup>3</sup>
<b>Rack Mount Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>4</sup>
2130R31	UPS3000XHV <sup>4</sup>
32P1692	UPS Extend Run Battery Pack <sup>4</sup>
37L6861	APC Smart-UPS 5000RMB <sup>5</sup>
<b>Monitors<sup>6</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>7</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
9512AB1	T541 Flat Panel Color Monitor (381mm, 15in viewable image), stealth black <sup>3</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>

1. xSeries 225 model definitions include either a single 425w nonhot-swap power supply or dual hot-swap 350w power supplies, which provide N+N redundancy. Each power supply includes a 6ft NEMA 5-15P power cord.  
 2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.  
 3. Not supported for rack mounting.  
 4. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.  
 5. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.  
 6. xSeries 225 uses an integrated ATI Rage XL video controller with 8MB of memory.  
 7. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).  
 8. Includes a 15in Flat Panel Monitor.



Part Number	Description
<b>Conversion Kits</b>	
59P4817	4U Extended Depth Tower to Rack Conversion Kit
<b>Rack and NetBAY<sup>1</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 1x4 Console Switch
<b>Keyboard and Mouse<sup>3</sup></b>	
28L3644	Space Saver II Keyboard <sup>4, 5</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>5, 6, 7</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>4, 7</sup>
28L3673	Sleek 2-Button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>7</sup>

1. Rack installation of xSeries 225 requires 4U Extended Depth Tower to Rack Conversion Kit (P/N 49P4817) and one of the racks listed in the Rack Cabinets and Options section.

2. Refer to the Rack Console Options section for information regarding console connectivity using these options.

3. The xSeries 225 includes both a mouse and nonspace saver keyboard.

4. Installation within a rack requires optional keyboard tray (P/N 28L4707), which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).

5. Advanced TrackPoint IV features are not available on IBM xSeries systems.

6. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.

7. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.



### xSeries 225 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures <sup>2</sup>
48P7042	20/40GB TR7 Internal IDE Tape Drive <sup>1</sup>	2	-	89mm (3.5in) SL or 133mm (5.25in) HH	-	-
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	2	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>3</sup>	3510020 <sup>4</sup> 0034B0X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>3</sup>	0034B0X
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>3</sup>	0034B0X
24P2396	100/200GB LTO Half-High Tape Drive <sup>7, 8</sup>	2	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>3</sup>	3510020 <sup>4</sup> 0034B0X
24P2398	40/80GB Half-High DLTVS Internal SCSI Tape Drive <sup>8</sup>	2	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>3</sup>	3510020 <sup>4</sup> 0034B0X
<b>Tape Autoloaders</b>						
360716X	3607 Series 1760GB/3.5TB SDLTpro Tape Autoloader	-	16 Ultra2 LVD	2U Rack	Y	-
<b>External Tape Enclosures</b>						
0034B0X	NetBAY Tape Enclosure (Rack Mount) <sup>5</sup>	-	16 Ultra2 LVD	4U Rack	N	-
3510020	External Half-High SCSI Storage Enclosure <sup>6</sup>	-	16 LVD	Desktop	N	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext	Y	3510020
32P8164	External SCSI Interface Kit	-	16 LVD	Int	N	-

**Note:**

All models include an integrated Ultra320 SCSI controller. Nonhot-swap models include a four-drop multimode terminated LVD SCSI cable. Hot-swap models include a one-drop nonterminated cable. To enable external attachment to channel B of the integrated SCSI controller, optional External SCSI Interface Kit (P/N 32P8164) is required, which provides a 0.8mm VHDCI external connector. All SCSI tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646), which includes a five-drop multimode terminated LVD SCSI cable and an external 0.8mm VHDCI connector. SCSI tape drives installed internally can be connected to channel A of the integrated controller using the cable that ships with the tape drive if the HDDs or hot-swap backplane are attached to ServeRAID-4Lx. If ServeRAID-5i is installed, channel B can be configured to support half-high SCSI tape drives installed in an external tape enclosure or installed in bay two.

1. All models include a two-drop IDE cable for attachment to the CD-ROM and an IDE tape drive.
2. To determine external cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
3. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
5. This 4U rack-mounted enclosure supports four full-high or six half-high tape drives. The backplate includes six 0.8mm VHDCI external connectors for attachment of up to six servers. Internal connection of tape drives requires the single-drop terminated LVD SCSI cable that ships with the tape drive, which also provides termination for the SCSI bus. A single 300w power supply with a low-voltage power cord is standard. An external SCSI storage cable is not provided. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
7. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.
8. Supported only in new builds of External Half-High SCSI Storage Enclosure (P/N 3510020), indicated by AI Header J1PJK on the outside box label of the tape enclosure.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.



## xSeries 225 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

<b>Sales and Distribution Application Server (tower solution for 150 users)</b>		
<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
8647-22X	xSeries 225 2GHz/400MHz-512KB Xeon, 256MB ECC, 36.4GB, 48x	1
59P5112	2GHz/400MHz-512KB L2 Cache Upgrade with Xeon Processor	1
33L5038	512MB DDR PC2100 ECC RDIMM	2 <sup>1</sup>
25P3492	ServeRAID-5i Controller	1
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	3 <sup>2</sup>
48P7042	20/40GB TR7 Internal IDE Tape Drive	1
32P8164	External SCSI Interface Kit	1
35311RU	EXP300 Storage Expansion Unit	1
09N7296	EXP300 Rack-to-Tower Conversion Kit	1
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	8 <sup>3</sup>
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black	1
94G3136	APC Smart-UPS 1400	1
94G3134	APC Smart-UPS 700 <sup>4</sup>	1

1. For a total of 1.25GB of system memory.
2. Three HDDs are configured in RAID-5. Effective capacity is two HDDs or 72.8GB.
3. Eight HDDs are configured in RAID-5 with one hot-spare. Effective capacity is six HDDs or 218.4GB.
4. This UPS is optional if required to support the EXP300 Storage Expansion Unit.

<b>File and Print Server (tower solution for 2,000 users)</b>		
<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
8647-32X	xSeries 225 2.4BGHz/533MHz-512KB Xeon, 256MB ECC, 36.4GB, 48X	1
59P5108	2.4BGHz/533MHz-512KB L2 Cache Upgrade with Xeon Processor	1
33L5038	512MB DDR PC2100 ECC RDIMM	2 <sup>1</sup>
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	3 <sup>2</sup>
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	1
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller	2 <sup>3</sup>
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals	1
35311RU	EXP300 Storage Expansion Unit	1
09N7296	EXP300 Rack-to-Tower Conversion Kit	1
03K9310	Netfinity 2m Ultra2 SCSI Cable	1
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	12 <sup>4</sup>
9512AB1	T541 Flat Panel Color Monitor 15in (381mm, 15in viewable image), stealth black	1
94G3136	APC Smart-UPS 1400	1
94G3134	APC Smart-UPS 700 <sup>5</sup>	1

1. For a total of 1.25GB of system memory.
2. Two HDDs are mirrored using the integrated HDD mirroring function of the onboard controller. A third identical HDD is assigned as a hot-spare. The SCSI tape drive is attached to channel B.
3. Redundant RAID connections are provided to support the external HDD enclosure.
4. Twelve HDDs are configured in twin-tail RAID-5 buses each with one hot-spare. Effective capacity is eight HDDs or 291.2GB.
5. This UPS is optional if required to support the EXP300 Storage Expansion Unit.



<b>Microsoft Exchange Server (rack solution for 2,200 users)</b>		
<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
8647-3AX	xSeries 225 2.4BGHz/533MHz-512KB Xeon, 512MB ECC, open hot-swap, 48x	1
59P5108	2.4BGHz/533MHz-512KB L2 Cache Upgrade with Xeon Processor	1
33L5039	1GB DDR PC2100 ECC RDIMM	2 <sup>1</sup>
25P3492	ServeRAID-5i Controller	1
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	2 <sup>2</sup>
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap HDD	4 <sup>3</sup>
48P7042	20/40GB TR7 Internal IDE Tape Drive	1
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard)	1
32P1020	APC 2U Smart-UPS 1400RMB	1
59P4817	4U Extended Depth Tower to Rack Conversion Kit	1 <sup>4</sup>

1. For a total of 2.5GB of system memory.
2. Two HDDs are configured for NOS mirroring.
3. Four HDDs are configured in RAID-5. Effective capacity is three HDDs or 440.4GB.
4. Rack and rack options are not included in this list of options.

<b>Lotus Notes Server (rack solution for 2,200 users)</b>		
<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
8647-3BX	xSeries 225 2.4BGHz/533MHz-512KB Xeon, 512MB ECC, open hot-swap, 48x	1
59P5108	2.4BGHz/533MHz-512KB L2 Cache Upgrade with Xeon Processor	1
33L5039	1GB DDR PC2100 ECC RDIMM	2 <sup>1</sup>
25P3492	ServeRAID-5i Controller	1
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	2 <sup>2</sup>
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	4 <sup>3</sup>
32P8164	External SCSI Interface Kit	1
3510020	External Half-High SCSI Storage Enclosure	1 <sup>4</sup>
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	1
03K9310	Netfinity 2m Ultra2 SCSI Cable	1
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	1
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard)	1
32P1020	APC 2U Smart-UPS 1400RMB	1
59P4817	4U Extended Depth Tower to Rack Conversion Kit	1 <sup>5</sup>

1. For a total of 2.5GB of system memory.
2. Two HDDs are configured for NOS mirroring.
3. Four HDDs are configured in RAID-5. Effective capacity is three HDDs or 220.2GB.
4. Connected to channel B of the integrated controller through the External SCSI Interface Kit external connector and 2m external SCSI cable.
5. Rack and rack options are not included in this list of options.





# IBM xSeries 235

## EMEA Part Number Cross Reference

xSeries 235 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
K111Xxx	867111X	8671-11X	Xeon 1.8GHz/400MHz, 512KB, 256MB, Open Bay U320, Tower	---
K11AXxx	86711AX	8671-1AX	Xeon 1.8GHz/400MHz, 512KB, 512MB, Open Bay U320, Redundant Power, Tower	---
K121Xxx	867121X	8671-21X	Xeon 2.0GHz/400MHz, 512KB, 256MB, Open Bay U320, Tower	---
P12AXxx	86712AX	8671-2AX	Xeon 2.0GHz/400MHz, 512KB, 512MB, Open Bay U320, Redundant Power, Tower	---
K141Xxx	867141X	8671-41X	Xeon 2.4GHz/400MHz, 512KB, 256MB, Open Bay U320, Tower	---
K14AXxx	86714AX	8671-4AX	Xeon 2.4GHz/400MHz, 512KB, 512MB, Open Bay U320, Redundant Power, Tower	---
K161Xxx	867161X	8671-61X	Xeon 2.67GHz/553MHz, 512KB, 512MB, Open Bay U320, Tower	---
K16AXxx	86716AX	8671-6AX	Xeon 2.67GHz/553MHz, 512KB, 512MB, Open Bay U320, Redundant Power, Tower	---
K171Xxx	867171X	8671-71X	Xeon 2.8GHz/553MHz, 512KB, 512MB, Open Bay U320, Tower	---
K17AXxx	86717AX	8671-7AX	Xeon 2.8GHz/553MHz, 512KB, 512MB, Open Bay U320, Redundant Power, Tower	---

xSeries 235 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2  
Notes 6&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 235 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION FIBRE STORAGE OPTIONS	EMEA WDFM DATE
71P81xx	174290U	---	FAST900 Storage Server	---
24P09xx	17421RU	---	FAST700 Storage Server	---
00N69xx	35521RU	---	FAST500 Storage Server	---
19K11xx	35421RU	---	FAST200 Storage Server	---
19K11xx	35422RU	---	FAST200 HA Storage Server	---

Notes 2&F1  
Notes 2&F2  
Notes 2&F3  
Notes 2&F4  
Notes 2&F5

- Where 'xx' represents a specific country code as follows: 29=Euro/English, 30=Euro/Spanish, 31=Euro/French, 32=Euro/German, 33=Danish/, 34=Israel/English, 35=Italian/English, 36=South Africa/English, 37=Swiss/English, 38=Swiss/French, 39=Swiss/German, 40=UK/English.
- Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.
- Where 'xx' represents a specific country code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

# IBM xSeries 235

## EMEA Part Number Cross Reference

xSeries 235 I/O Option Part Numbers					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION PCI	EMEA WDFM DATE	
	22P6550	19K4162	---	V90 PCI Data/Fax WinModem	---
	N/A	33L4618	---	V90 PCI Data/Fax WinModem	N/A
Note 7	37L14xx	37L14xx	---	Serial I/O SST 8 and 16 port Adapters	Note 7
Note 8	09N75xx	09N7585	---	Remote Supervisor Adapter	---

7. Serial I/O Adapter P/Ns 37L1414 and 37L1415 are available. Other Serial I/O adapter part numbers are withdrawn from marketing in EMEA.

8. Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA..

xSeries 235 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE	
Note 9	33P29xx	33P2753	---	560W Hot-Swap Power Upgrade Kit	---
Note 10	SUP072Y	94G3134	---	APC Smart-UPS 700	---
	SUP102Y	94G3135	---	APC Smart-UPS 1000	---
	SUP142Y	94G3136	---	APC Smart-UPS 1400	---
Note 11	32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 12	32P1681	2130R30	---	UPS3000XLV	---
Note 13	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

9. The xSeries 235 ships with one or two standard country power cords. If conversion to Rack format is being carried out, connection to a high voltage UPS or PDU requires one or two Rack Power Cables P/N 94G7448.

10. Where 'xx' represents a specific country code as follows: 54=Europe, 55=Denmark, 56=Israel, 57=Italy, 58=South Africa, 59=Switzerland, 60=UK, .

11. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

12. Only available in Saudi Arabia.

13. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

xSeries 235 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 14	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 14	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 14	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 14	T12ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

14. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

xSeries 235 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 15	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 16	10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
Note 17	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
	28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

15. Where 'xx' represents a specific country code as follows:- 46=Danish, 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portuguese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

16. Where 'xx' represents a specific country code as follows:- 53=Danish, 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

17. Where 'xx' represents a specific country code as follows:- 53=Danish, 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

xSeries 235 Tape Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
Note 18	00N79xx	360716X	---	3607 Series 1760GB/3.5TB SDLT pro Tape Autoloader	---
	10L7440	3510020	---	External Half High SCSI Storage Enclosure	---
Note 19	24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---
	03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---

18. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

19. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 235

Part Number<sup>1</sup>  
 Withdrawal Date<sup>13</sup>  
 Processor Speed (GHz)  
 Number of Processors (Std/Max)  
 L2 ECC Cache (KB)  
 Memory (Std/Max) (DIMM)<sup>4</sup>  
 Form Factor  
 Power Supply Quantity (Std/Max)  
 Hot-Swap (Power, Slots, HDD, Fans)<sup>5</sup>  
 Redundancy (Optional, Standard)<sup>6</sup>  
 System Management Processor  
 Onboard Ethernet (Mbps)<sup>7</sup>  
 SCSI Controller (Dual, Ultra, RAID)<sup>8</sup>  
 Removable Media Bays (Total/Avail)<sup>9</sup>  
 Internal HDD Storage (Std/Max)<sup>10</sup>  
 CD-ROM (IDE)<sup>11</sup>  
 Bays (Total/Avail)<sup>12</sup>  
 Slots (Total/Avail)

## xSeries 235 At-A-Glance

Part Number	Withdrawal Date	Processor Speed (GHz)	Number of Processors (Std/Max)	L2 ECC Cache (KB)	Memory (Std/Max) (DIMM)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal HDD Storage (Std/Max)	CD-ROM (IDE)	Bays (Total/Avail)	Slots (Total/Avail)
8671-11X	25-Mar	1.8 <sup>2</sup>	1/2	512	256MB/6GB	Tower	1/2	S, H, F	O - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-1AX	25-Mar	1.8 <sup>2</sup>	1/2	512	512MB/6GB	Tower	2/2	P, S, H, F	S - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-21X	-	2 <sup>2</sup>	1/2	512	256MB/6GB	Tower	1/2	S, H, F	O - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-2AX	-	2 <sup>2</sup>	1/2	512	512MB/6GB	Tower	2/2	P, S, H, F	S - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-41X	-	2.4 <sup>2</sup>	1/2	512	256MB/6GB	Tower	1/2	S, H, F	O - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-4AX	-	2.4 <sup>2</sup>	1/2	512	512MB/6GB	Tower	2/2	P, S, H, F	S - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-61X	-	2.67 <sup>3</sup>	1/2	512	512MB/6GB	Tower	1/2	S, H, F	O - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-6AX	-	2.67 <sup>3</sup>	1/2	512	512MB/6GB	Tower	2/2	P, S, H, F	S - Power, S - Fans <sup>7</sup>	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-71X	-	2.8 <sup>3</sup>	1/2	512	512MB/6GB	Tower	1/2	S, H, F	O - Power, S - Fans	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6
8671-7AX	-	2.8 <sup>3</sup>	1/2	512	512MB/6GB	Tower	2/2	P, S, H, F	S - Power, S - Fans <sup>7</sup>	Y	10/100/1000	D,U320	4/2	0/1321.2GB	48x-20x	10/8	6/6

1. Ships with standard keyboard and mouse. See Power, Monitors and Accessories section for tower-to-rack conversion kit.  
 2. Intel Xeon processor with advanced transfer L2 cache and 400MHz (quad-pumped) access to memory and I/O buses.  
 3. Intel Xeon processor with advanced transfer L2 cache and 533MHz (quad-pumped) access to memory and I/O buses.  
 4. High-speed, two-way interleaved 133MHz DDR PC2100 RDIMM.  
 5. Includes two hot-plug PCI-X 64-bit 133MHz slots, three 64-bit 100MHz nonhot-plug slots and one 32-bit 33MHz slot. See I/O Options section for additional information.  
 6. Power supply redundancy for models shipping without standard redundancy requires removal of the standard 560w power supply and the addition of two 560w hot-swap power supplies and a hot-swap power backplane provided with the 560w Hot-swap Power Upgrade Kit (P/N 33P2753) in 400MHz FSB models or 560w Power Supply for 533MHz FSB (02R1874). Redundant models (N+N for full configurations) include two standard 560w hot-swap power supplies and a hot-swap power backplane. See xSeries 235 Power, Monitor & Accessories for additional information.  
 7. The standard Ethernet controller is a Broadcom 5703 gigabit Ethernet controller integrated into the planar.  
 8. The dual-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed. One additional HDD may be designated as a hot-spare for HDDs configured in the onboard mirror. Mirrored and hot-spare HDDs must be matched.  
 9. xSeries 235 includes two available removable media bays that can be converted to three slim-line (SL) hot-swap bays with the addition of optional Ultra320 3-Pack Kit (P/N 33P2751).  
 10. Assumes installation of optional Ultra320 3-Pack Kit (P/N 33P2751), which converts the two available removable media bays into three slim-line (SL) hot-swap bays. Maximum storage is based on nine 146.8GB 10Krpm Ultra320 SCSI Hot-swap HDDs (P/N 32P0728).  
 11. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.  
 12. The total number of bays can be increased to 11 by installing an optional Ultra320 3-pack Kit (P/N 33P2751), which converts the two available removable media bays to three SL hot-swap HDD bays.  
 13. Not available from IBM after this date. Business Partner inventory may be available.

**xSeries 235 Processors**

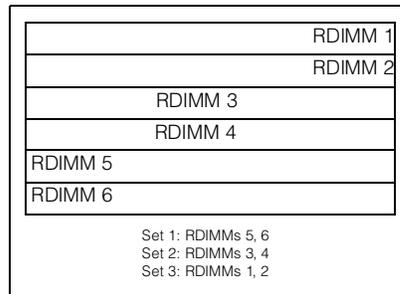
Part Number	Processor Upgrades	SMP Support <sup>1</sup>	Processor Speed Upgrade <sup>2</sup>
19K4642	1.8GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	1xX	-
33P2931	2GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	2xX	1xX
37L3533	2.4GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	4xX	1 ... 2xX
71P8966	Upgrade Xeon Processor 2.67GHz/533MHz-512KB L2 Cache	6xX	-
71P8967	Upgrade Xeon Processor 2.8GHz/533MHz-512KB L2 Cache	7xX	6xX

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.  
 2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access [www.pc.ibm.com/support](http://www.pc.ibm.com/support) and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS."

**xSeries 235 Memory**

Part Number	Memory Description <sup>1</sup>
33L5036	128MB DDR PC2100 ECC RDIMM
33L5037	256MB DDR PC2100 ECC RDIMM
33L5038	512MB DDR PC2100 ECC RDIMM
33L5039	1GB DDR PC2100 ECC RDIMM
33L5040	2GB DDR PC2100 ECC RDIMM

1. Due to two-way interleaving, installation of memory options in matched pairs beginning with set 1 is required.





Total System Memory <sup>1</sup>		Quantity of RDIMMs Added <sup>2</sup>				
256MB (2 x 128) Models	512MB (2 x 256) Models	128MB (33L5036)	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)	2GB (33L5040)
512MB	768MB	2	-	-	-	-
768MB	1GB	4	-	-	-	-
1GB	1.25GB	2	2	-	-	-
1.25GB	1.5GB	-	4	-	-	-
1.75GB	2GB	-	2	2	-	-
2GB	2.5GB	-	-	4	-	-
2.5GB	2.75GB	2	-	-	2	-
2.75GB	3GB	-	2	-	2	-
3.25GB	3.5GB	-	-	2	2	-
4.25GB	4.5GB	-	-	-	4	-
6GB <sup>3</sup>	6GB <sup>3</sup>	-	-	-	6	-
8GB <sup>3</sup>	8GB <sup>3</sup>	-	-	-	4	2
10GB <sup>3</sup>	10GB <sup>3</sup>	-	-	-	2	4
12GB <sup>3</sup>	12GB <sup>3</sup>	-	-	-	-	6

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row.
3. Requires replacing the standard RDIMMs.

### xSeries 235 Internal SCSI Cabling

The xSeries 235 contains 10 drive bays in the standard base configuration. The six 3.5in hot-swap bays on the lower half of the chassis front support Ultra320 or Ultra160 hot-swap HDDs. The four media bays above the HDD bays include a 3.5in bay for the standard floppy disk drive (FDD) and a 5.25in bay containing the standard CD-ROM. The two open 5.25in media bays are available for removable media devices such as tape drives, or an Ultra320 3-bay kit can be installed in two available media bays to provide a hot-swap backplane that supports three slim-line hot-swap HDDs.

The standard six-bay hot-swap backplane connects to one channel of the dual-channel integrated Ultra320 storage controller through a single-drop 16-bit LVD SCSI cable. If internal RAID is required, this cable cannot be used to connect optional ServeRAID-4H, -4Mx or -4Lx controllers to the hot-swap backplane. Instead, optional Single-drop Internal LVD Ultra160 SCSI Cable (P/N 71P8995) must be purchased. If the RAID controller is ServeRAID-5i, a cable is not required and both channels of the integrated controller are managed by ServeRAID-5i. The standard SCSI cable cannot be used to connect to an optional SCSI media device because it is not terminated.

One full-high or half-high tape drive can be installed in the available media bays. The terminated LVD SCSI cable provided with the tape drive can be used to connect the tape drive to the integrated controller if ServeRAID-4H, -4Mx or -4Lx are installed (or if no RAID controller is installed). If ServeRAID-5i is installed, only supported tape drives can be connected to the RAID bus (see Tape Options section). If the tape drive is not supported for RAID attachment or the configuration does not require the tape drive to be installed on the RAID bus, PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) is required.

External tape drive support requires installation of External SCSI Interface Kit (P/N 32P8164) to connect the external port to the second channel of the integrated controller. The external port cannot be enabled if both channels of the integrated controller are connected internally. If ServeRAID-5i is installed, only RAID-supported tape drives can be installed in the tape enclosure. An external tape enclosure is also supported by installing PCI Wide Ultra160 SCSI Adapter (P/N 19K4646), in which case the External SCSI Interface Kit is no longer required.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**

**xSeries 235 Hard Disk Drive (HDD) Storage**

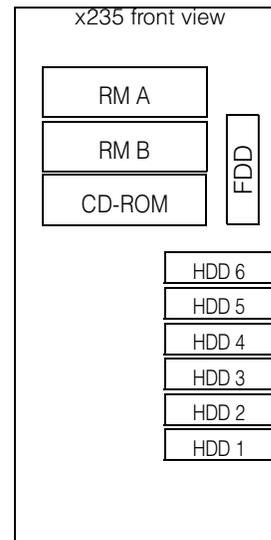
Total Internal Storage <sup>1</sup>	10,000rpm HDDs				15,000rpm HDDs		
	18.2GB (06P5754)	36.4GB (06P5755, 32P0726) <sup>4</sup>	73.4GB (06P5756, 32P0727) <sup>4</sup>	146.8GB (32P0728)	18.2GB (06P5767)	36.4GB (32P0734, 06P5768, 06P5776) <sup>4</sup>	73.4GB (32P0735)
0GB	Standard on base models						
18.2GB	1	-	-	-	1	-	-
36.4GB	2	1	-	-	2	1	-
54.6GB	3	-	-	-	3	-	-
72.8GB	4	2	-	-	4	2	-
91GB	5	-	-	-	5	-	-
109.2GB	6	3	-	-	6	3	-
145.6GB	-	4	-	-	-	4	-
182GB	-	5	-	-	-	5	-
218.4GB	-	6	-	-	-	6	-
327.6GB <sup>2</sup>	-	9	-	-	-	9	-
440.4GB	-	-	6	-	-	-	6
660.6GB <sup>3</sup>	-	-	9	-	-	-	9
880.8GB <sup>2</sup>	-	-	-	6	-	-	-
1321.2GB <sup>3</sup>	-	-	-	9	-	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. Internal storage using 36.4GB HDD can be increased to 327.6GB by converting the two available removable bays to three hot-swap HDD bays using an optional Ultra320 3-Pack Kit (P/N 33P2751).
3. Maximum internal storage using 73.4GB HDD can be increased to 660.6GB by converting the two available removable media bays to three hot-swap HDD bays using an optional Ultra320 3-Pack Kit (P/N 33P2751).
4. When an Ultra320 HDD is installed in the same SCSI bus as an Ultra160 HDD, performance of the entire bus is reduced to Ultra160 speeds.

Bay	Form Factor	Height	Front Access	Usage
A <sup>1</sup>	133mm (5.25in)	HH <sup>2</sup>	Yes	Open
B <sup>1</sup>	133mm (5.25in)	HH <sup>2</sup>	Yes	Open
C <sup>3</sup>	133mm (5.25in)	HH	Yes	IDE CD-ROM
D <sup>4</sup>	89mm (3.5in)	SL	Yes	Diskette
1 ... 6	HS	SL	Yes	Open

1. Removable media bays A and B can be converted to three hot-swap HDD bays using the optional Ultra320 3-Pack Kit (P/N 33P2751).
2. Two half-high (HH) bays can be combined to support a single full-high (FH) device.
3. This bay supports optical drives only.
4. This bay supports a floppy disk drive only.





Part Number	Description	RPM	Height	Bays Supported <sup>1</sup>	Maximum Quantity <sup>2</sup>
<b>Hot-Swap Ultra160 HDDs</b>					
06P5754	18.2GB 10Krpm Ultra 160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	9
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	9
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	9
06P5767	18.2GB 15Krpm Ultra 160 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	9
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	9
<b>Hot-Swap Ultra320 HDDs</b>					
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 6	9
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 6	9
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 6	9
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	9
32P0734	36.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1 ... 6	9
32P0735	73.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1 ... 6	9
<b>Associated Options</b>					
33P2751	Ultra320 3-Pack Kit <sup>3</sup>	-	-	A+B	1
32P8164	External SCSI Interface Kit <sup>4</sup>	-	-	-	1
<b>Optical Devices</b>			<b>Bays Supported</b>		
22P6950	16X Max RAM-Read DVD-ROM Drive <sup>5, 6</sup>	A, B, C			
22P6970	Multi-Burner <sup>5, 6</sup>	A, B, C			
22P6973	32x-10x-40x-16x Max CD-RW/DVD-ROM Combination Drive <sup>5, 6</sup>	A, B, C			
<b>External Storage Expansion Units<sup>7</sup></b>			<b>Form Factor</b>		
35311RU	EXP300 Storage Expansion Unit <sup>8</sup>	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
17401RU	FAST EXP700 Storage Expansion Unit <sup>9</sup>	Rack (3U)			
35601RU	FAST EXP500 Storage Expansion Unit <sup>10</sup>	Rack (3U)			
35421RU	FAST200 Storage Server <sup>11, 12</sup>	Rack (3U)			
35422RU	FAST200 HA Storage Server <sup>11</sup>	Rack (3U)			
19K1121	FAST200 Redundant RAID Controller	-			

1. Install HDDs in the order indicated in the system bay diagram (from bottom of chassis). If an Ultra320 3-pack Kit is installed, install HDDs from bottom to top.
2. Maximum quantity of HDDs can be increased to nine by converting the two removable media bays to three SL HDD bays using the 3-Pack Ultra320 3-Pack Kit (P/N 33P2751).
3. Removable media bays A and B can be converted to three SL hot-swap bays using the optional Ultra320 3-Pack Kit (P/N 33P2751). The hot-swap backplane is cabled as an independent bus. All HDDs installed in the bus must be Ultra320 in order for the bus to operate at Ultra320. If one or more HDDs installed are Ultra160, the entire bus will operate at Ultra160 speeds.
4. Required to enable a 0.8mm VHDCI external connector for external SCSI attachment to the second channel of the integrated controller. Refer to Appendix D: Cables - Storage Units - Controllers for additional information.
5. Either replace standard CD-ROM or install in one of the media bays. An IDE cable with three connectors is included with the optional optical drive. If installing as an additional device, connect the cable to each optical device and the IDE connector on the system board. Configure the optional device as a master using the preset configuration if replacing the standard device or as a slave if installed as a redundant device.
6. Audio and video are not supported for DVD-ROM drives. The drive reads data signals only.
7. To configure a SCSI storage device, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.
8. EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required. In order to attach EXP300 to the integrated controller when ServeRAID-5i is installed, External SCSI Interface Kit (P/N 32P8164) is required to enable a 0.8mm VHDCI external connector on the system chassis.
9. FAST EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.
10. FAST EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350w power supplies, each with its own power cord.
11. The FAST200 includes two hot-swap, 350w auto-ranging redundant power supplies, each with its own power cord.
12. Can be upgraded to FAST200 HA Storage Server through the addition of a FAST200 Redundant RAID Controller (P/N 19K1121).



**xSeries 235 I/O Options**

Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>1, 18</sup>	Hot-Plug <sup>2</sup>	PCI Voltage Key	MHz
<b>Storage Controllers<sup>3</sup></b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	2 ... 4	X	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	2 ... 4	X	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>6</sup>	Half	64-bit	2 ... 4	X	Universal	66
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>7</sup>	Half	32-bit	2 ... 6	-	Universal	33
25P3492	ServeRAID-5i Controller <sup>8</sup>	Full	64-bit	4	-	Universal	66
<b>Internal RAID Cable</b>							
71P8995	Single-drop Internal LVD Ultra160 SCSI Cable	-	-	-	-	-	-
<b>Fibre Storage Controllers and Options<sup>9</sup></b>							
00N6881	FAST Host Adapter	Half	64-bit	2 ... 6	X	Universal	66
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	2 ... 6	X	Universal	133
174290U	FAST900 Storage Server (US line cord)	-	-	-	-	-	-
17421RU	FAST700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FAST500 Storage Server	-	-	-	-	-	-
35421RU	FAST200 Storage Server	-	-	-	-	-	-
35422RU	FAST200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>10</sup>	-	-	-	-	-	-
<b>Networking<sup>11</sup></b>							
<b>Ethernet<sup>12</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>13</sup>	Half	32-bit	2 ... 6	X	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>13</sup>	Half	64-bit	2 ... 6	X	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>13</sup>	Half	64-bit	2 ... 6	X	Universal	133
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	2 ... 6	X	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>13</sup>	Half	64-bit	2 ... 6	X	Universal	133
<b>Token Ring</b>							
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	2 ... 6	X	Universal	33
34L5001	16/4 Token-Ring PCI Management Adapter <sup>13</sup>	Half	32-bit	2 ... 6	X	Universal	33
<b>Communications<sup>14</sup></b>							
19K4162	V90 PCI Data/Fax WinModem (Low Profile Enabled) <sup>15</sup>	Half	32-bit	1 ... 6	-	Universal	33
33L4618	V90 PCI Data/Fax Modem <sup>15</sup>	Half	32-bit	1	-	5	33
37L14xx	Serial I/O SST 8- and 16-port adapters <sup>16</sup>	Half	32-bit	1	-	5	33
<b>System Management</b>							
09N7585	Remote Supervisor Adapter <sup>17</sup>	Half	32-bit	1	-	Universal	33

Note: xSeries 235 supports the IXA Adapter (P/N 1519100) for connection to iSeries models for Windows 2000 Server and Advanced Server. Installation is restricted to slot four and Remote Supervisor Adapter (P/N 09N7585) must be installed.

1. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot. 33MHz adapters will reduce 66MHz buses to 33MHz. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.
2. Slots five and six (bus 2) are hot-plug capable. For Network Operating System support, access [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat).
3. xSeries 235 includes a dual-channel Ultra320 SCSI controller with two internal connectors. An external 0.8mm VHDCI connector can be enabled using optional External SCSI Interface Kit (P/N 32P8164) to connect channel A to the external connector. External connection using this option and the external knockout is not supported if both channels of the integrated controller are connected internally, in which case a supported PCI SCSI controller is required to support an external SCSI device. See "Internal SCSI Cabling" for cabling alternatives.
4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache with two internal and four external Ultra160 connectors (a combination of four connectors may be utilized). External connectors are 0.8mm VHDCI. Connection of this adapter to the HDD backplane requires optional Single-drop Internal LVD Ultra160 SCSI Cable (P/N 71P8995), which is a 30in single-drop round nonterminated LVD SCSI cable.
5. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connections are 0.8mm VHDCI. Connection of this adapter to the HDD backplane requires optional Single-drop Internal LVD Ultra160 SCSI Cable (P/N 71P8995), which is a 30in single-drop nonterminated LVD SCSI cable.
6. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI. Connection of this adapter to the HDD backplane requires optional Single-drop Internal LVD Ultra160 SCSI Cable (P/N 71P8995), which is a 30in single-drop round nonterminated LVD SCSI cable.
7. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized.
8. ServeRAID-5i (P/N 25P3492) supports both Ultra320 and Ultra160 HDDs in a dedicated or mixed environment. The adapter installs into PCI slot four and converts both channels of the



onboard SCSI controller to RAID in conjunction with the LSI 1020/30 chipset. Both the standard and the optional SCSI HDD backplanes cable directly to the onboard controller connectors. Half-high tape drives can be supported either internally or externally on the second channel of an integrated controller managed by ServeRAID-5i if the bus is designated as SCSI during RAID setup. Supports up to 528MB/s data transfers across the PCI bus with 128MB ECC SDRAM write-back cache with battery backup. Supports RAID levels 0, 1, 10, 5, 50 and 1E.

9. See Fibre Channel Solutions Overview section for additional configuration information.

10. The 2108R3L SAN Data Gateway Router Ultra SCSI LVD Port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).

11. xSeries 235 includes a copper integrated 10/100/1000Mbps Broadcom (BCM5703) single-port Ethernet controller.

12. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Three optional Ethernet adapters are copper and Intel-based (P/N 06P3601, 22P4901, 22P6801). Two are Broadcom-based (P/N 22P7801, 31P6301).

13. The Wake on LAN (WoL) function provided by this Ethernet PCI adapter is supported in this system.

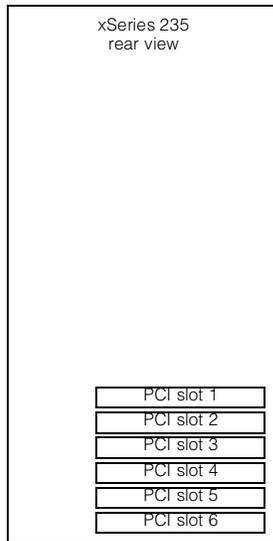
14. xSeries 235 provided three USB ports (two on the rear of the chassis and one on the front), one serial port, two RS-485 ports for system management and one parallel port.

15. Due to homologation variances, modem availability may differ by country.

16. See Appendix E for details on Serial I/O options and configuration limitations.

17. When installed in xSeries 235, Remote Supervisor Adapter (RSA) shares functionality with the integrated service processor and serves as interface for both. RSA provides full system management functionality through a customer-supplied Ethernet cable or modem connection or as part of an interconnected system management bus (option includes all interconnect hardware). An external Cat5 connection between RSA and the integrated service processor using the pigtail cable and short Cat5 cable supplied with RSA is not required. The 20-pin ribbon cable connecting RSA to the planar meets all powering and signaling requirements. Connection of the external AC power supply provided with RSA is not required.

18. Models 1 ... 4xX with 400MHz FSB support most PCI adapters also in slot one.



Slot 1: Bus 0, 32-bit, 33MHz, 5v, full-length

Slot 2: Bus 1 (primary), 64-bit, 100MHz, 3.3v, full-length PCI-X

Slot 3: Bus 1 (primary), 64-bit, 100MHz, 3.3v, full-length PCI-X

Slot 4: Bus 1 (secondary), 64-bit, 100MHz, 3.3v, full-length extended PCI-X (supports RAID 5i)

Slot 5: Bus 2, 64-bit, 100MHz, 3.3v, full-length Active PCI-X

Slot 6: Bus 2, 64-bit, 100MHz, 3.3v, full-length Active PCI-X



**xSeries 235 Power, Monitors & Accessories**

<b>Part Number</b>	<b>Description</b>
<b>Power<sup>1</sup></b>	
33P2753	560w Power Upgrade Kit <sup>2</sup>
02R1874	560w Power Supply for 533MHz FSB <sup>3</sup>
<b>Uninterruptible Power Supply (UPS)<sup>4</sup></b>	
94G3134	APC Smart-UPS 700 <sup>5</sup>
94G3135	APC Smart-UPS 1000 <sup>5</sup>
94G3136	APC Smart-UPS 1400 <sup>5</sup>
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>6</sup>
2130R31	UPS3000XHV <sup>6</sup>
32P1692	UPS Extend Run Battery Pack <sup>6</sup>
37L6861	APC Smart-UPS 5000RMB <sup>7</sup>
<b>Monitors<sup>8</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>9</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>9</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>9</sup>
9512AB1	T541 Flat Panel Color Monitor (381mm, 15in viewable image), stealth black <sup>5</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>10</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>10</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>10</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>10</sup>

1. xSeries 235 redundant power models include two hot-swap 560w power supplies, each with two power cords. Nonredundant power models include a single nonhot-swap 560w power supply with a single power cord. N+N power supply redundancy for these models may be achieved by removing the standard power supply and installing a hot-swap power backplane and two 560w hot-swap redundant power supplies provided in the 560w Power Upgrade Kit (P/N 33P2753) for 400MHz FSB models or the 560w Power Supply Upgrade for 533MHz FSB models (P/N 02R1874).

2. 560w Power Upgrade Kit (P/N 33P2753) includes a power backplane, two power supplies and two 9ft power cords. Compatible only with 400MHz FSB models.

3. 560w Power Upgrade Kit (P/N 33P2753) includes a power backplane, two power supplies and two 9ft power cords. Compatible only with 533MHz FSB models.

4. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

5. Not supported for rack mounting.

6. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.

7. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.

8. xSeries 235 uses an integrated ATI Rage XL video controller with 8MB of memory.

9. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).

10. Includes a 15in Flat Panel Monitor.



<b>Part Number</b>	<b>Description</b>
<b>Conversion Kits</b>	
59P4211	5Ux24D Tower-to-Rack Kit III
<b>Rack and NetBAY<sup>1</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>3</sup></b>	
28L3644	Space Saver II Keyboard <sup>4, 6</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>5, 7</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>4, 6, 7</sup>
28L3673	Sleek 2-Button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>7</sup>

1. Rack installations require a supported IBM rack and a tower-to-rack conversion kit.
2. Refer to the Rack Console Options section for information regarding console connectivity using these options.
3. xSeries 235 includes tower models only and ships with a keyboard and mouse.
4. Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).
5. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.
6. Advanced TrackPoint IV features are not available on IBM xSeries systems.
7. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.



### xSeries 235 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures
00N7991	20/40GB DDS/4 4mm Internal Tape Drive <sup>1</sup>	A, B	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>2</sup>	3510020 <sup>4</sup> 3551001 <sup>3</sup> 0034B0X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	A+B	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
00N8016	100/200GB LTO Tape Drive	A+B	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
24P2396	100/200GB LTO Half-High Tape Drive <sup>1, 11, 12</sup>	A, B	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup> 3510020 <sup>4</sup> 0034B0X
24P2398	40/80GB Half-High DLTVS Internal SCSI Tape Drive <sup>1, 12</sup>	A, B	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup> 3510020 <sup>4</sup> 0034B0X
59P6736	160/320GB SDLT Tape Drive	A+B	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3503B1X 0034B0X
<b>Tape Autoloaders</b>						
00N7992	120/240GB DDS/4 Tape Autoloader	A+B	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
360716X	3607 Series 1760GB/3.5TB SDLTpro Tape Autoloader	-	16 Ultra2 LVD	2U Rack	Y	-
<b>External Tape Enclosures</b>						
3510020	External Half-High SCSI Storage Enclosure <sup>5</sup>	-	16 LVD	Desktop	N	-
3503B1X	Full-High SCSI Tape Enclosure <sup>7</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-
0034B0X	NetBAY Tape Enclosure (Rack Mount) <sup>8</sup>	-	16 Ultra2 LVD	4U Rack	N	-
3551001	NetMEDIA Storage Expansion Unit EL <sup>9</sup>	-	16 LVD	Rack	Y	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext	Y	3510020
32P8164	External SCSI Interface Kit <sup>10</sup>	-	16 LVD	Int	Y	-

Note: Optional External SCSI Interface Kit (P/N 32P8164) is required to enable the external 0.8mm VHDCI connector on the rear of the chassis to support external tape enclosures. Attachment of internal media bay devices to one connector of the Ultra320 controller requires a supported terminated SCSI cable that is provided with optional tape drives. If the hot-swap HDD backplane is connected to ServeRAID-4H, 4Mx or 4Lx, an internal tape drive can be connected to the integrated controller. If ServeRAID-5i supports the internal HDD backplanes, some tape drives can be supported on channel B of the integrated controller (which is managed by the ServeRAID-5i adapter) if the bus is designated as conventional SCSI during set-up and Microsoft Windows 2000 is installed. ServeRAID-5i supports the same tape drives in an external tape enclosure on the second channel if the external SCSI port is enabled (the external port cannot be enabled if both channels of the integrated controller are connected internally). Optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) also supports external tape enclosures and internal tape drives.

1. Supported by ServeRAID-5i when installed on an internal bus connected to an integrated controller connector or in an external tape enclosure when connected to the second channel of the integrated controller through the enabled external SCSI port.
2. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.
3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.
4. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
5. If installed in a rack, a fixed shelf is required. Allow an additional 1U for the fixed shelf. One unit only per shelf is supported.
6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
7. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016, 00N7992.
8. This 4U rack-mounted enclosure supports four full-high or six half-high tape drives. The backplate includes six 0.8mm VHDCI external connectors for attachment of up to six servers. Internal connection of tape drives requires the single-drop terminated LVD SCSI cable that ships with the tape drive, which also provides termination for the SCSI bus. A single 300w power supply with a low-voltage power cord is standard. An external SCSI storage cable is not provided. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
9. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.
10. Required to connect one channel of the integrated Ultra320 storage controller to the 0.8mm VHDCI external port, which cannot be enabled if both channels of the integrated controller are connected internally.
11. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.
12. Supported only in new builds of External Half-High SCSI Storage Enclosure (P/N 3510020), indicated by AI Header J1PJK on the outside box label of the tape enclosure.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.



### xSeries 235 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

#### File and Print Server (large user base)

Part Number	Description	Quantity
8671-21X	xSeries 235 2GHz/512KB Xeon, 256MB ECC, open, 48X	1
33L5036	128MB DDR PC2100 ECC DIMM	2 <sup>1</sup>
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2 <sup>2</sup>
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	4 <sup>3</sup>
25P3492	ServeRAID-5i Controller	1
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	1
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black	1
94G3136	APC Smart-UPS 1400	1

1. For a total of 512MB of system memory.
2. Two HDDs are used to provide NOS mirroring.
3. Three HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective capacity is two HDDs or 72.8GB.

#### High-availability Microsoft Exchange Server Solution

Part Number	Description	Quantity
8671-2AX	xSeries 235 2GHz/512KB Xeon, 512MB ECC, open, 48X	1
33P2931	2GHz/400MHz - 512KB L2 Cache Upgrade Option with Xeon Processor	1 <sup>1</sup>
33L5037	256MB DDR PC2100 ECC DIMM	2
25P3492	ServeRAID-5i Controller	1
09N7585	Remote Supervisor Adapter	1
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2 <sup>2</sup>
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	4 <sup>3</sup>
32P8164	External SCSI Interface Kit	1
33P2753	560w Power Upgrade Kit III	1
59P4211	5Ux24DTower-to-Rack Kit	1
9306250	NetBAY25 Standard Rack Cabinet	1
3551001	NetMEDIA Storage Expansion Unit EL	1
24P2398	40/80GB Half-High DLTVS Internal SCSI Tape Drive	1
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black	1
32P1020	APC 2U Smart-UPS 1400RMB	1
94G6670	Blank Filler Panel Kit	1

1. For a total of 1GB of system memory.
2. Two HDDs are used to provide NOS mirroring.
3. Three HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective capacity is two HDDs or 72.8GB.





# IBM xSeries 255

## EMEA Part Number Cross Reference

xSeries 255 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
P541Xxx	868541X	8685-41X	Xeon MP 1.5GHz/400MHz, 1MB, 512MB, Open Bay U160, Tower	---
K54RXxx	86854RX	8685-4RX	Xeon MP 1.5GHz/400MHz, 1MB, 512MB, Open Bay U160, Rack	---
P551Xxx	868551X	8685-51X	Xeon MP 1.9GHz/400MHz, 1MB, 1GB, Open Bay U160, Tower	---
K55RXxx	86855RX	8685-5RX	Xeon MP 1.9GHz/400MHz, 1MB, 1GB, Open Bay U160, Rack	---
P561Xxx	868561X	8685-61X	Xeon MP 2.0GHz/400MHz, 2MB, 1GB, Open Bay U160, Tower	---
K56RXxx	86856RX	8685-6RX	Xeon MP 2.0GHz/400MHz, 2MB, 1GB, Open Bay U160, Rack	---

xSeries 255 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 255 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	33L4618	---	V90 PCI Data/Fax WinModem	N/A
09N75xx	09N7585	---	Remote Supervisor Adapter	---

Note 6

- Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA..



# IBM xSeries 255

## EMEA Part Number Cross Reference

xSeries 255 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
Sup142Y	94G3136	---	APC Smart-UPS 1400	---
Note 8 32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 9 32P1681	2130R30	---	UPS3000XLV	---
Note 10 32P16xx	2130R31	---	UPS3000XHV	---
37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

7. The xSeries 255 ships with two standard country power cords. If conversion to Rack format is being carried out, connection to a high voltage UPS or PDU requires two Rack Power Cables P/N 94G7448.

8. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

9. Only available in Saudi Arabia.

10. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

xSeries 255 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
Note 11 T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 11 T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 11 T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 11 T12ABxx	9512AB1	9512-AB1	T541 15" Flat Panel Colour Monitor (S/Black)	---
N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

11. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

xSeries 255 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
Note 12 28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 13 10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
Note 14 22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
Note 15 31P74xx	31P7415	---	IBM Preferred Pro Full-size Keyboard - 104 keys	---
28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

12. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

13. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

14. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

15. Where 'xx' represents a specific country code as follows:- 16=Arabia, 17=Belg/Fre, 18=Belg/UK, 19=Bulgaria, 21=Czech Republic, P/N 31P8767=Czech/US, 22=Denmark, 23=Netherlands, 24=France, 27=Germany, 28=Greece, 29=Israel, 30=Hungary, 31=Iceland, 32=Italy, P/N 31P8250=Italian 141, 36=Norway, 37=Poland, 38=Portugal, 39=Romania, 40=Russia, 41=Rus/Cyrillic, 42=Serb/Cyrillic, 43=Slovak, 44=Spanish, 45=Sweden/Finland, 46=Switzerland, 48=Turkey 440, 49=Turkey 179, 50=UK English, 51=US/Euro, 52=Yugoslavia/La

xSeries 255 Tape Options				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
Note 16 00N79xx	360716X	---	3607 Series 1760GB/3.5TB SDLT pro Tape Autoloader	---
Note 17 24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---
03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---

16. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

17. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 255

Part Number  
 Processor Speed (GHz)<sup>3</sup>  
 Number of Processors (Std/Max)  
 L3 ECC Cache  
 Memory (Std/Max)<sup>6</sup>  
 Form Factor  
 Power Supply Quantity (Std/Max)  
 Hot-Swap (Power, Slots, HDD, Fans)  
 Redundancy (Optional, Standard)<sup>7</sup>  
 System Management Processor  
 Onboard Ethernet (Mbps)  
 SCSI Controller (Dual, Ultra, RAID)  
 Removable Media Bays (Total/Avail)  
 Internal HDD Storage (Std/Max)<sup>8</sup>  
 CD-ROM (IDE)<sup>9</sup>  
 Bays (Total/Avail)<sup>10</sup>  
 Slots (Total/Avail)

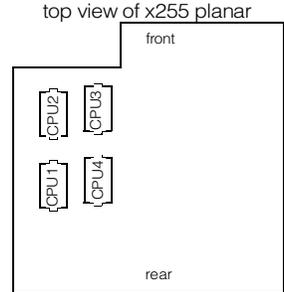
xSeries 255 At-A-Glance																
8685-41X <sup>1</sup>	1.5	1/4	1MB	512MB/12GB	Tower	2/4	P, S, H, F	S-Fans O-Power	Y	10/100/1000	D, U 160	4/2	0/1761.6GB	48x-20x	16/14	7/7
8685-4RX <sup>2</sup>	1.5	1/4	1MB	512MB/12GB	Rack (7U)	2/4	P, S, H, F	S-Fans O-Power	Y	10/100/1000	D, U 160	4/2	0/1761.6GB	48x-20x	16/14	7/7
8685-51X <sup>1</sup>	1.9	1/4	1MB	1GB/12GB	Tower	2/4	P, S, H, F	S-Fans O-Power	Y	10/100/1000	D, U 160	4/2	0/1761.6GB	48x-20x	16/14	7/7
8685-5RX <sup>2</sup>	1.9	1/4	1MB	1GB/12GB	Rack (7U)	2/4	P, S, H, F	S-Fans O-Power	Y	10/100/1000	D, U 160	4/2	0/1761.6GB	48x-20x	16/14	7/7
8685-61X <sup>1</sup>	2	1/4	2MB	1GB/12GB	Tower	2/4	P, S, H, F	S-Fans O-Power	Y	10/100/1000	D, U 160	4/2	0/1761.6GB	48x-20x	16/14	7/7
8685-6RX <sup>2</sup>	2	1/4	2MB	1GB/12GB	Rack (7U)	2/4	P, S, H, F	S-Fans O-Power	Y	10/100/1000	D, U 160	4/2	0/1761.6GB	48x-20x	16/14	7/7

Note: xSeries 255 supports the IXA Adapter (P/N 1519100) for connection to iSeries models for Windows 2000 Server and Advanced Server. Installation is restricted to slot two and Remote Supervisor (P/N 09N7585) must be installed.

1. Ships with standard keyboard and mouse. See Power, Monitors and Accessories section for tower-to-rack conversion kit.
2. Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. See Rack Cabinets and Options section for supported IBM racks.
3. Intel Xeon MP processor with integrated full-speed ECC L3 cache and 400MHz (quad-pumped) access to memory and I/O buses.
4. Advanced Chipkill ECC memory corrects two-, three-, and four-bit memory errors. Standard memory supports two-way interleaving. Two or four optional RDIMMs are installed in pairs to support two-way interleaving (up to a total of six RDIMMs). Four-way interleaving is supported with the selection of two optional RDIMMs and selection of an additional four or eight RDIMMs in groups of four. Hot-spare memory is supported for both two-way interleaving (up to six RDIMMs) and four-way interleaving (see Memory section). Four-way interleaving outperforms two-way interleaving. Memory options must match in density and technology in order to support interleaving and hot-spare memory.
5. Two optional 370w Reversed Fan Hot-swap Redundant Power Supplies (P/N 31P6133) are required to support N+N redundancy. Refer to the Power section in xSeries 255 Power, Monitor & Accessories for additional information.
6. Maximum internal HDD storage capacity is based on 12 hot-swap 146.8GB HDDs, which requires optional 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163). Both the standard and optional hot-swap HDD backplanes are Ultra320, but only Ultra160 HDDs are supported.
7. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
8. Total number of bays includes the standard bays plus six additional bays provided by installation of optional 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163).

**xSeries 255 Processor Upgrades**

Part Number	Processor Upgrades	SMP Support <sup>1</sup>	Processor Speed Upgrade <sup>2</sup>
59P5111	xSeries 1.4GHz/400MHz-512KB Xeon MP Processor Option	1xX	-
59P5106	xSeries 1.5GHz/400MHz-512KB Xeon MP Processor Option	2xX	1xX
59P5107	xSeries 1.6GHz/400MHz-1MB Xeon MP Processor Option	3xX	1xX, 2xX
59P6815	1.5GHz/400MHz-1MB L3 Cache Xeon Processor MP	4xX	-
59P6816	1.9GHz/400MHz-1MB L3 Cache Xeon Processor MP	5xX	4xX
59P6817	2GHz/400MHz-2MB L3 Cache Xeon Processor MP	6xX	4xX, 5xX

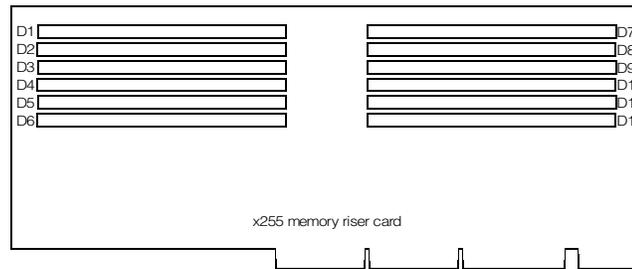


1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size. See diagram for order of installation.  
 2. Requires removal of the standard processor. A maximum of four processors may be installed (see xSeries 255 planar diagram for order of installation). All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access [www.pc.ibm.com/support](http://www.pc.ibm.com/support) and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS."

**xSeries 255 Memory**

Part Number	Memory Description
33L3281	256MB PC1600 ECC DDR SDRAM RDIMM
33L3283	512MB PC1600 ECC DDR SDRAM RDIMM
33L3285	1GB PC1600 ECC DDR SDRAM RDIMM

1. To support two-way interleaving, optional RDIMMs must be installed in pairs up to a maximum of six RDIMMs including the standard RDIMMs. To support four-way interleaving, the first two optional RDIMMs are installed to complete one four-way set, then the next two sets are installed, each of which includes four matching RDIMMs. All RDIMMs in a set must be the same density and technology, but the sets are not required to match other sets. Four-way interleaving provides improved performance benefits over two-way interleaving. Chipkill support is provided on the memory card. See RDIMM Order of Installation table below.



**RDIMM Order of Installation and Hot Spare Memory Configuration**

Interleaving	Quantity of RDIMMs	RDIMM Set	Bank	Hot Spare Memory <sup>2</sup>
2-way <sup>1</sup>	2	D2, D8	3	-
2-way	4	D4, D10	2	Bank 3
2-way	6	D6, D12	1	Bank 3
4-way <sup>2</sup>	4	D1, D2, D7, D8	3	-
4-way	8	D3, D4, D9, D10	2	Bank 3
4-way	12	D5, D6, D11, D12	1	Bank 3

1. Two RDIMMs installed in D2 and D8 are standard in base models with two-way interleaving enabled. If two-way interleaving is maintained, then a pair of RDIMMs can be installed in D4 and D8 and two more in D6 and D12. If four-way interleaving is enabled, RDIMMs must be added in D1 and D7 to complete Bank 3, then four RDIMMs are added in Bank 2 and four more RDIMMs can be added in Bank 1.  
 2. If Hot Spare Memory is enabled by the system BIOS, memory bank 3 is used as a spare bank in the event of RDIMM failure. Bank 3 serves as a hot spare for both banks 1 and 2. Hot Spare Memory does not apply when only two RDIMMs are installed or when only four RDIMMs are installed with four-way interleaving. Hot Spare Memory is not addressable by the CPU until activated. Memory density and technology must be the same in both the active and spare banks.



Total Memory <sup>1</sup>		Quantity of RDIMMs Added <sup>2</sup>		
512MB (2x256MB models)	1GB (2x512MB models)	256MB (33L3281)	512MB (33L3283)	1GB (33L3285)
1GB	-	2	-	-
2GB	-	6	-	-
-	2GB	-	2	-
3GB	-	10	-	-
-	3GB	4	2	-
4GB	-	6	4	-
-	4GB	8	2	-
5GB	-	2	8	-
-	5GB	4	6	-
-	6GB	-	2	4
7GB	-	2	4	4
-	7GB	4	2	4
-	8GB	-	6	4
9GB	-	2	-	8
10GB <sup>3</sup>	-	-	4	8
-	10GB	-	2	8
12GB <sup>3</sup>	12GB <sup>3</sup>	-	-	12

This table does not represent all possible memory configurations. Four-way interleaving is assumed for the purposes of this table. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the Quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row.
3. Requires removal of standard RDIMMs.

### xSeries 255 Internal SCSI Cabling

The xSeries 255 contains 10 standard bays with the option of adding an additional six HDD bays. The six standard slim-line hot-swap HDD bays are located on the upper left half of the front of both tower and rack models. Four removable media bays are located on the right-side front of the chassis. The top bay contains the standard floppy disk drive and the second bay from the top contains the standard CD-ROM drive. The remaining two removable media bays support tape or optical drive options.

The standard Ultra320 hot-swap backplane supports six hot-swap HDD bays. The backplane is connected to the integrated dual-channel, Ultra160 SCSI controller through a standard 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect the backplane to a supported RAID controller. A second optional hot-swap backplane with six hot-swap HDD bays is supported for installation directly below the standard backplane. The optional backplane can be configured as an independent SCSI bus with the addition of an optional SCSI storage controller or it can be configured with the six standard hot-swap HDD bays by connecting each of the hot-swap backplanes to separate connectors of a two- or four-channel RAID controller. The optional backplane cannot be connected to the integrated SCSI controller if the standard backplane remains connected, and there is no accommodation for connecting the two backplanes directly.

Supported internal tape drives include a 34-inch terminated SCSI cable for connecting optional tape drives to either a supported SCSI controller or to channel A of the integrated SCSI controller if the hot-swap backplane is connected to an optional controller. The standard CD-ROM is cabled to the IDE port on the planar through a two-drop IDE cable.

External attachment of supported SCSI devices requires installation of the optional External SCSI Interface Kit (P/N 32P8164), which provides a SCSI cable with an external 0.8mm VHDCI connector that attaches to the rear of the chassis and connects at the other end to the 68-pin connector of channel B on the planar.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**



**xSeries 255 Hard Disk Drive (HDD) Storage**

Total Int Storage <sup>1</sup>	10,000rpm HDDs				15,000rpm HDDs	
	18.2GB (06P5754) <sup>2</sup>	36.4GB (32P0726, 06P5755) <sup>2</sup>	73.4GB (32P0727, 06P5756) <sup>2</sup>	146.8GB (32P0728) <sup>2</sup>	18.2GB (06P5767) <sup>2</sup>	36.4GB (06P5768) <sup>2</sup>
0GB	Standard on base models					
18.2GB	1	-	-	-	1	-
36.4GB	2	1	-	-	2	1
54.6GB	3	-	-	-	3	-
72.8GB	4	2	-	-	4	2
91GB	5	-	-	-	5	-
109.2GB	6	3	-	-	6	3
127.4GB	7	-	-	-	7	-
145.6GB	8	4	-	-	8	4
163.8GB	9	-	-	-	9	-
182GB	10	5	-	-	10	5
200.2GB	11	-	-	-	11	-
218.4GB	12	6	-	-	12	6
254.8GB	-	7	-	-	-	7
291.2GB	-	8	-	-	-	8
327.6GB	-	9	-	-	-	9
364GB	-	10	-	-	-	10
367GB	-	-	5	-	-	-
400.4GB	-	11	-	-	-	11
436.8GB	-	12	-	-	-	12
440.4GB	-	-	6	3	-	-
513.8GB	-	-	7	-	-	-
587.2GB	-	-	8	4	-	-
660.6GB	-	-	9	-	-	-
734GB	-	-	10	5	-	-
807.4GB	-	-	11	-	-	-
880.8GB	-	-	12	6	-	-
1027.8GB	-	-	-	7	-	-
1174.4GB	-	-	-	8	-	-
1321.2GB	-	-	-	9	-	-
1468GB	-	-	-	10	-	-
1614.8GB	-	-	-	11	-	-
1761.6GB	-	-	-	12	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice. Quantities exceeding six require installation of 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163), which supports bays seven through 12.
2. xSeries 255 ships standard with a dual-channel, Ultra160 SCSI storage controller. The standard backplane supports Ultra 160 HDDs at Ultra160 speeds when connected to the standard integrated storage controller or at Ultra320 speeds (320MBps) with the addition of an optional Ultra320 storage controller (future).



Part Number	Description	RPM	Height	Bays Supported <sup>2</sup>	Maximum Quantity <sup>2</sup>
<b>Hot-swap Ultra160 SCSI HDDs<sup>1</sup></b>					
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 12	12
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 12	12
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 12	12
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1 ... 12	12
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1 ... 12	12
<b>Hot-swap Ultra320 HDDs<sup>1</sup></b>					
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 12	12
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 12	12
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 12	12
<b>Associated Options</b>					
32P8163	6-pack Ultra320 Hot-swap Expansion Kit <sup>3</sup>	-	-	6 ... 12	1
<b>External Storage Expansion Units<sup>4</sup></b>		<b>Form Factor</b>			
35311RU	EXP300 Storage Expansion Unit <sup>5</sup>	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
35601RU	FASiT EXP500 Storage Expansion Unit <sup>6</sup>	Rack (3U)			
35421RU	FASiT200 Storage Server <sup>7, 8</sup>	Rack (3U)			
35422RU	FASiT200 HA Storage Server <sup>7</sup>	Rack (3U)			
19K1121	FASiT200 Redundant RAID Controller	-			

1. xSeries 255 contains an Ultra320 hot-swap backplane which supports Ultra160 HDDs at Ultra160 bus speeds when connected to the standard integrated storage controller or Ultra320 speeds when connected to an Ultra320 PCI controller (future). Installation of Ultra320 HDDs and an Ultra320 controller are required to support Ultra320 bus speeds. If one or more Ultra160 HDDs are installed, the entire bus is limited to Ultra160 speeds.

2. Maximum quantity requires installation of 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163), which supports bays seven through 12.

3. xSeries 6-pack Ultra320 Hot-swap Expansion Kit is used to provide an additional hot-swap backplane supporting a single SCSI channel with up to six HDDs.

4. Not supported by the onboard external SCSI port. To configure an external SCSI storage devices, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm that the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.

5. EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.

6. FASiT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350w power supplies, each with its own power cord.

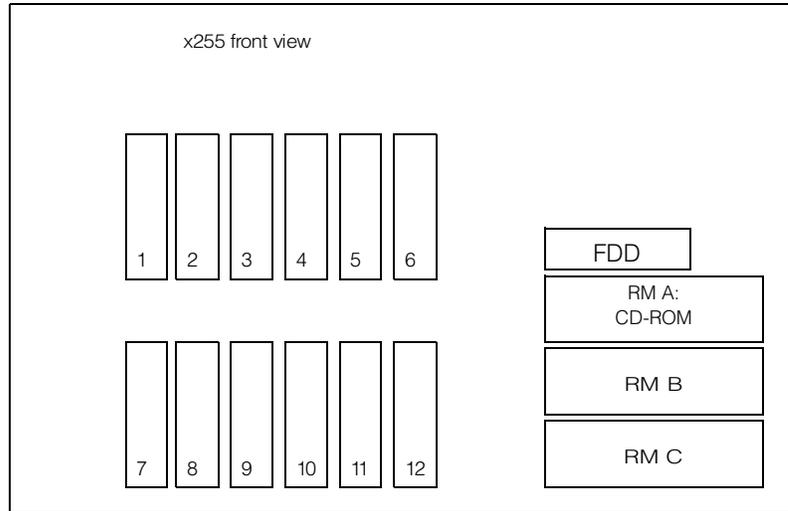
7. The FASiT200 includes two hot-swap, 350w auto-ranging redundant power supplies, each with its own power cord.

8. Can be upgraded to FASiT200 HA Storage Server through the addition of a FASiT200 Redundant RAID Controller (P/N 19K1121).

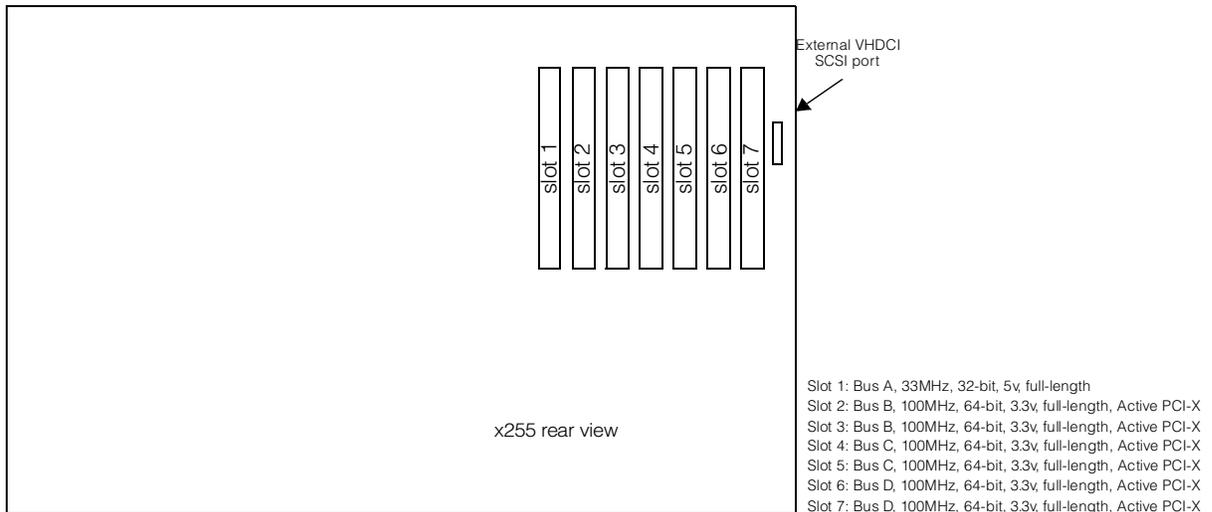
Bay	Form Factor	Height	Front Access	Usage
-	89mm (3.5in)	SL	Yes	FDD
RM A	133mm (5.25in)	HH	Yes	CD-ROM
RM B	133mm (5.25in)	HH <sup>1</sup>	Yes	Open
RM C	133mm (5.25in)	HH <sup>1</sup>	Yes	Open
(1 ... 12) <sup>2</sup>	HS	SL	Yes	Open

- Two half-high (HH) bays can be combined to support a single full-high (FH) device
- Optional 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163) is required to support bays seven through 12.

Note: Install HDDs in the same order as bays are numbered, i.e., bays one to 12.



**xSeries 255 I/O Options**





Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>1</sup>	Hot-Plug <sup>2</sup>	PCI Voltage Key	MHz
<b>Storage Controllers<sup>3</sup></b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	1 ... 7	X	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	1 ... 7	X	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>6</sup>	Half	64-bit	1 ... 7	X	Universal	66
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>7</sup>	Half	32-bit	1 ... 7	-	Universal	66
<b>Fibre Storage Controllers and Options<sup>8</sup></b>							
00N6881	FAStT Host Adapter	Half	64-bit	1 ... 7	X	Universal	66
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	1 ... 7	X	Universal	133
17421RU	FAStT700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FAStT500 Storage Server	-	-	-	-	-	-
35421RU	FAStT200 Storage Server	-	-	-	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>9</sup>	-	-	-	-	-	-
<b>Networking<sup>10</sup></b>							
<b>Ethernet<sup>11</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>12</sup>	Half	32-bit	1 ... 7	X	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>12</sup>	Half	64-bit	1 ... 7	X	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>12</sup>	Half	64-bit	1 ... 7	X	Universal	133
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	1 ... 7	X	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>12</sup>	Half	64-bit	1 ... 7	X	Universal	133
<b>Token Ring</b>							
34L5001	16/4 Token-Ring PCI Management Adapter <sup>12</sup>	Half	32-bit	1 ... 7	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter <sup>12</sup>	Half	32-bit	1 ... 7	X	Universal	33
<b>Communications<sup>13</sup></b>							
33L4618	V.90 PCI Data/Fax Modem <sup>14</sup>	Half	32-bit	1	-	5	33
<b>System Management</b>							
09N7585	Remote Supervisor Adapter <sup>15</sup>	Half	32-bit	1	-	Universal	33

Note: xSeries 255 supports the IXA Adapter (P/N 1519100) for connection to iSeries models for Windows 2000 Server and Advanced Server. Installation is restricted to slot two and Remote Supervisor (P/N 09N7585) must be installed.

- The 5v slots support universal or 5v adapters. The 3.3v slots support universal or 3.3v adapters. A higher frequency adapter plugged into a lower frequency slot will operate at the slot frequency. A lower frequency (e.g., 33MHz) adapter plugged into a higher frequency (e.g., 66MHz) slot limits other adapters installed on the same bus to the lower frequency. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.
- Slots two through seven are hot-pluggable. For Network Operating System support access [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat).
- All models include a dual-port, dual-channel, 64-bit Wide Ultra160 SCSI controller with one internal connector connected to the standard hot-swap backplane with a standard Ultra160 SCSI cable. The second connector supports one external port, which is enabled by installing an External SCSI Interface Kit (P/N 32P8164) with a 0.8mm Very High Density Connection Interface (VHDCI).
- ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache with two internal and four external Ultra160 connectors (a combination of four connectors may be utilized). External connectors are 0.8mm VHDCI.
- ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connections are 0.8mm VHDCI.
- ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI. Both the standard and optional backplanes cannot be attached to this controller in a single configuration.
- PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized.
- See Fibre Channel Solutions Overview section for additional configuration information.
- The 2108R3L SAN Data Gateway Router Ultra SCSI LVD port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).
- xSeries 255 includes an integrated copper Broadcom 10/100/1000Mbps Ethernet controller, which supports Wake on LAN.
- In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Two of the optional adapters (P/N 22P7801, 31P6301) are Broadcom-based. Three of the optional PCI Ethernet adapters listed are copper and Intel-based (P/N 06P3601, 22P4901, 22P6801).
- The Wake on LAN function of this option is not supported by this server.
- xSeries 255 includes four USB ports, one external serial port and two integrated RS-485 system management interconnect ports located on the back of the system chassis. Connection of the standard service processor to other servers in an interconnect network requires a customer-supplied Cat5 cable.
- Due to homologation variances, modem availability may differ by country.
- When installed in xSeries 255, Remote Supervisor Adapter (RSA) shares functionality with the integrated service processor and serves as interface for both. RSA provides full system management functionality through a customer-supplied Ethernet cable or modem connection or as part of an interconnected system management bus (option includes all interconnect hardware). An external Cat5 connection between RSA and the integrated service processor using the pigtail cable and short Cat5 cable supplied with RSA is not required. The 20-pin ribbon cable connecting RSA to the planar meets all powering and signaling requirements. Connection of the external AC power supply provided with RSA is not required.



**xSeries 255 Power, Monitors & Accessories**

Part Number	Description
<b>Power<sup>1</sup></b>	
31P6133	370w Reversed Fan Hot-swap Redundant Power Supply
<b>Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
94G3136	APC Smart-UPS 1400 <sup>3</sup>
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>4</sup>
2130R31	UPS3000XHV <sup>4</sup>
32P1692	UPS Extend Run Battery <sup>4</sup>
37L6861	APC Smart-UPS 5000RMB <sup>5</sup>
<b>Monitors<sup>6</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>7</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>8</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>8</sup>
9512AB1	T541 Flat Panel Color Monitor (381mm, 15in viewable image), stealth black <sup>3</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>9</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>9</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>9</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>9</sup>

1. xSeries 255 includes two 370w hot-swap power supplies with the ability to accept two additional 370w Reversed Fan Hot-swap Redundant Power Supplies (P/N 31P6133). Each power supply bus in rack models includes an IEC 9ft rack power cable (P/N 36L8886) for attachment to NetBAY Rack PDUs and high voltage UPS units. The US country kit for rack models includes two NEMA 5-15P cords (P/N 6952300) for connection to a low voltage UPS, low voltage PDU or wall outlet. Tower models ship with two 18m NEMA 5-15P cords (P/N 6952301). Each of the two standard power supplies is installed on a separate bus. Installation of one optional power supply on each bus is required to achieve full power redundancy. Additional power cords are not used.

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

3. Not supported for rack mounting.

4. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.

5. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.

6. xSeries 255 uses an SVGA controller (S3 Trio 3D chipset) with 4MB of video memory.

7. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).

8. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

9. Includes a 15in Flat Panel Monitor.



Part Number	Description
<b>Conversion Kits</b>	
32P1474	7Ux26D Tower-to-Rack Kit
<b>Rack and NetBAY<sup>1</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>3</sup></b>	
28L3644	Space Saver II Keyboard <sup>4, 6</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>5, 7</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>4, 6, 7</sup>
31P7415	Preferred Pro Full-size Keyboard - 104 Keys (stealth black)
33L3244	Sleek USB Mouse (stealth black) <sup>7</sup>
28L3673	Sleek 2-Button Stealth Black Mouse

1. xSeries 255 rack models are housed in a 19in rack-mountable drawer and require one of the racks listed in the Rack Cabinets and Options section.

2. Refer to the Rack Console Options section for information regarding console connectivity using these options.

3. xSeries 255 rack models ship without a keyboard or mouse.

4. Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).

5. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.

6. Advanced TrackPoint IV features are not available on IBM xSeries systems.

7. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.



**xSeries 255 Tape Options**

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures
00N7991	20/40GB DDS/4 4mm Internal Tape Drive <sup>6</sup>	B, C	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>1</sup>	3551001 <sup>2</sup>
00N7990	40/80GB DLT Internal SCSI Tape Drive	B+C	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>1</sup>	3551001 <sup>2</sup> 3503B1X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	B+C	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>1</sup>	3551001 <sup>2</sup> 3503B1X
00N8016	100/200GB LTO Tape Drive	B+C	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>1</sup>	3551001 <sup>2</sup> 3503B1X
24P2396	100/200GB LTO Half-High Tape Drive <sup>7</sup>	B, C	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>1</sup>	3551001 <sup>2</sup>
24P2398	40/80GB Half-High DLTVS Internal SCSI Tape Drive	B, C	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>1</sup>	3551001 <sup>2</sup>
59P6736	160/320GB SDLT Tape Drive	B+C	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>1</sup>	3503B1X
<b>Tape Autoloaders</b>						
360716X	3607 Series 1760GB/3.5TB SDLTpro Tape Autoloader	-	16 Ultra2 LVD	2U Rack	Y	-
00N7992	120/240GB DDS/4 Tape Autoloader	B+C	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>1</sup>	3551001 <sup>2</sup> 3503B1X
<b>External Tape Enclosures</b>						
3503B1X	Full-High SCSI Tape Enclosure <sup>3</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-
3551001	NetMEDIA Storage Expansion Unit EL <sup>4</sup>	-	16 LVD	Rack	Y	-
<b>Associated Options</b>						
32P8164	External SCSI Interface Kit <sup>5</sup>	-	16 Ultra2 LVD	-	Y	-

Note: xSeries 255 includes an external 0.8mm VHDCI connector for support of external SCSI devices. External SCSI Interface Kit (P/N 32P8164) is required to enable the external port.

1. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.

2. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.

3. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016, 00N7992, 00N7990.

4. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.

5. External SCSI Interface Kit (P/N 32P8164) is an internal terminated LVD SCSI cable with two screws for fastening to the rear of the chassis providing an external 0.8mm VHDCI connector, connecting to the 68-pin channel A connector located on the planar near PCI slot six.

6. The standard internal media power cable is not long enough to connect to this tape drive in xSeries 255. An optional longer media power cable is available (P/N 24P1053).

7. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.



## xSeries 255 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### High-availability, High-performance Seibel Application Server Solution

Part Number	Description	Quantity	Usage
8685-6RX	xSeries 255 2GHz/400MHz-2MB, 1GB ECC, open, 48x (7U rack)	1	-
59P6817	2GHz/400MHz-2MB L3 Cache Xeon Processor MP	3	Total of 4 SMP processors
33L3283	512MB PC1600 ECC DDR SDRAM RDIMM	6	4GB total memory (4-way interleaved)
06P5736	ServerRAID-4Mx Ultra160 SCSI Controller	1	RAID adapter
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2	18.2GB HDDs mirrored for NOS
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	8 <sup>1</sup>	218.4GB RAID 5 with hot-spare
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals	1	2 Ethernet ports total
09N7585	Remote Supervisor Adapter	1	system management adapter
32P8163	6-pack Ultra320 Hot-swap Expansion Kit	1	-
32P8164	External SCSI Interface Kit	1	enables external 0.8mm VHDCI connector
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	1	-
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard)	1	-
31P6133	370w Reversed Fan Hot-swap Redundant Power Supply	2	Full power redundancy
32P1020	APC 2U Smart-UPS 1400RMB	1	-
<b>External Storage</b>			
35311RU	EXP300 Storage Expansion Unit	1	Includes 2m Ultra2 cable
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	14	RAID 5 data storage with hot-spare
<b>Rack</b>			
9306250	NetBAY25 Standard Rack Cabinet	1	-
94G6670	Blank Filler Panel Kit	1	-

1. Eight HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective capacity is six HDDs or 218.4GB.

### High-availability Microsoft Exchange Server Solution

Part Number	Description	Quantity	Usage
8685-5RX	xSeries 255 1.9GHz/400MHz-1MB, 1GB ECC, open, 48x (7U rack)	1	-
59P6816	1.9GHz/400MHz-1MB L3 Cache Xeon Processor MP	3	Total of 4 SMP processors
33L3283	512MB PC1600 ECC DDR SDRAM RDIMM	2	2GB total system memory
06P5736	ServerRAID-4Mx Ultra160 SCSI Controller	1	RAID adapter
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals	1	2 Ethernet ports total
09N7585	Remote Supervisor Adapter	1	system management adapter
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2	18.2GB HDDs mirrored for NOS
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	8 <sup>1</sup>	218.4GB RAID 5 with hot-spare
32P8163	6-pack Ultra320 Hot-swap Expansion Kit	1	-
00N7990	40/80GB DLT Internal SCSI Tape Drive	1	-
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard)	1	-
31P6133	370w Reversed Fan Hot-swap Redundant Power Supply	2	Full power redundancy
32P1020	APC 2U Smart-UPS 1400RMB	1	-
<b>Rack</b>			
9306250	NetBAY25 Standard Rack Cabinet	1	-
94G6670	Blank Filler Panel Kit	1	-

1. Eight HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective capacity is six HDDs or 218.4GB.



**File and Print Server (large user base)**

<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>	<b>Usage</b>
8685-41X	xSeries 255 1.5GHz/400MHz-1MB, 512MB ECC, open, 48x	1	-
59P6815	1.5GHz/400MHz-1MB L3 Cache Xeon Processor MP	1	2 processors
33L3281	256MB PC1600 ECC DDR SDRAM RDIMM	2	1GB total memory (4-way interleaved)
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals	1	2 Ethernet ports total
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller	1	RAID adapter
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2	18.2GB HDDs mirrored for NOS
06P5755	36.4GB 10Krpm Ultra 160 SCSI Hot-swap SL HDD	6 <sup>1</sup>	72.8GB RAID 5 with hot-spare
32P8163	6-pack Ultra320 Hot-swap Expansion Kit	1	-
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	1	-
31P6133	370w Reversed Fan Hot-swap Redundant Power Supply	2	Full power redundancy
66274AN	G78 Color Monitor 17in (406.4mm, 16in viewable image), stealth black	1	-
94G3136	APC Smart-UPS 1400	1	-

1. Six HDDs per backplane are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective capacity is four HDDs or 145.6GB per backplane.

**IBM xSeries 255**



# IBM xSeries 305

## EMEA Part Number Cross Reference

xSeries 305 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
K312Xxx	867312X	8673-12X	P4 2.0GHz/400MHz, 512KB, 256MB, 40GB EIDE, Rack	---
K313Xxx	867313X	8673-13X	P4 2.0GHz/400MHz, 512KB, 256MB, 18.2GB U160, Rack	---
K342Xxx	867342X	8673-42X	P4 2.4GHz/533MHz, 512KB, 256MB, 40GB EIDE, Rack	---
K343Xxx	867343X	8673-43X	P4 2.4GHz/533MHz, 512KB, 256MB, 18.2GB U160, Rack	---
K34AXxx	86734AX	8673-4AX	P4 2.4GHz/533MHz, 512KB, 256MB, 36.4GB U160, DC Power, Rack	---
K362Xxx	867362X	8673-62X	P4 2.67GHz/533MHz, 512KB, 256MB, 40GB EIDE, Rack	---
K363Xxx	867363X	8673-63X	P4 2.67GHz/533MHz, 512KB, 256MB, 18.2GB U160, Rack	---

xSeries 305 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---

Notes 1&2

1. Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.

2. This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.

xSeries 305 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
37L14xx	37L14xx	---	Serial I/O SST 8 and 16 port Adapters	Note 3
09N75xx	09N7585	---	Remote Supervisor Adapter	---

Note 3  
Note 4

3. Serial I/O Adapter P/Ns 37L1414 and 37L1415 are available. Other Serial I/O adapter part numbers are withdrawn from marketing in EMEA.

4. Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA.

Note 5

xSeries 305 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
32P1681	2130R30	---	UPS3000XLV	---
32P16xx	2130R31	---	UPS3000XHV	---
37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

Note 6  
Note 7  
Note 8

5. The xSeries 305 ships with one standard country power cord and one Rack Power cord for connection either to a wall socket or a high voltage UPS or PDU.

6. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

7. Only available in Saudi Arabia.

8. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.



# IBM xSeries 305

## EMEA Part Number Cross Reference

xSeries 305 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 9	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 9	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 9	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyb.)	N/A
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyb.)	N/A

9. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

xSeries 305 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 10	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 11	10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/B)	---
Note 12	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
	28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

10. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

11. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

12. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

xSeries 305 Tape Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
Note 13	00N79xx	360716X	---	3607 Series 1760GB/3.5TB SDLT pro Tape Autoloader	---
Note 14	59P67xx	0034B0X	---	NetBAY Tape Enclosure (4U Rack mount)	---
	10L7440	3510020	---	External Half High SCSI Storage Enclosure	---
Note 15	24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---
	03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---

13. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

14. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

15. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 305

**Part Number**  
**Processor Speed (GHz)**  
**Number of Processors (Std/Max)**  
**L2 ECC Cache (KB)**  
**Memory (Std/Max)**  
**Form Factor**  
**Power Supply Quantity (Std/Max)**  
**Hot-Swap (Power, Slots, HDD, Fans)**  
**Redundancy (Optional, Standard)**  
**Adv System Management Processor**  
**Onboard Ethernet (Mbps)<sup>5</sup>**  
**Storage Controller (Dual, Ultra, RAID)**  
**Removable Media Bays (Total/Avail)**  
**Internal HDD Storage (Std/Max)**  
**CD-ROM (IDE)<sup>9</sup>**  
**Bays (Total/Avail)**  
**Slots (Total/Avail)<sup>10</sup>**

## xSeries 305 At-A-Glance

Part Number	Processor Speed (GHz)	Number of Processors (Std/Max)	L2 ECC Cache (KB)	Memory (Std/Max)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv System Management Processor	Onboard Ethernet (Mbps) <sup>5</sup>	Storage Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal HDD Storage (Std/Max)	CD-ROM (IDE) <sup>9</sup>	Bays (Total/Avail)	Slots (Total/Avail) <sup>10</sup>
8673-12X	2 <sup>2</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1	- -	N	2x10/100/1000	IDE	2/0	40GB/240GB <sup>7</sup>	24x-10x	4/1	2/2	
8673-13X	2 <sup>2</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1	- -	N	2x10/100/1000	U160 <sup>6</sup>	2/0	18.2GB/293.6GB <sup>8</sup>	24x-10x	4/1	2/1	
8673-42X	2.4 <sup>3</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1	- -	N	2x10/100/1000	IDE	2/0	40GB/240GB <sup>7</sup>	24x-10x	4/1	2/2	
8673-43X	2.4 <sup>3</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1	- -	N	2x10/100/1000	U160 <sup>6</sup>	2/0	18.2GB/293.6GB <sup>8</sup>	24x-10x	4/1	2/1	
8673-4AX <sup>4</sup>	2.4 <sup>3</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1 <sup>4</sup>	- -	N	2x10/100/1000	U160 <sup>6</sup>	2/0	36.4GB/293.6GB <sup>8</sup>	24x-10x	4/1	2/1	
8673-62X	2.67 <sup>3</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1	- -	N	2x10/100/1000	IDE	2/0	40GB/240GB <sup>7</sup>	24x-10x	4/1	2/2	
8673-63X	2.67 <sup>3</sup>	1/1	512	256MB/4GB	Rack (1U)	1/1	- -	N	2x10/100/1000	U160 <sup>6</sup>	2/0	18.2GB/293.6GB <sup>8</sup>	24x-10x	4/1	2/1	

1. Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. See Rack Cabinets and Options section for supported IBM racks.
2. Intel Pentium 4 processor with advanced transfer L2 cache and 400MHz (quad-pumped) Front-side Bus (FSB).
3. Intel Pentium 4 processor with advanced transfer L2 cache and 533MHz (quad-pumped) FSB.
4. includes a -48v to -60v 200w DC power supply designed for telecommunications applications.
5. Broadcom 5703 dual integrated gigabit Ethernet controllers.
6. Single channel Adaptec 29160 Ultra160 low-profile PCI SCSI storage controller installed in slot two.
7. Maximum capacity requires removing the standard IDE HDD and installing two 120GB IDE HDDs.
8. Maximum capacity requires removing the standard SCSI HDD and installing two 146.8GB SCSI HDDs.
9. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
10. SCSI models include a single-channel Ultra160 PCI SCSI adapter installed in slot two (low-profile slot).

**xSeries 305 Memory**

Part Number	Memory Description
33L5037	256MB DDR PC2100 ECC RDIMM
33L5038	512MB DDR PC2100 ECC RDIMM
33L5039	1GB DDR PC2100 ECC RDIMM

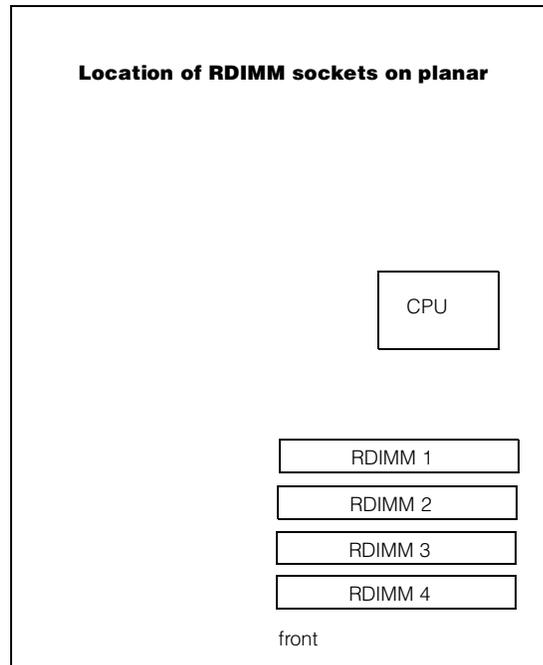
Note: xSeries 305 does not support memory interleaving. Compatible memory options of different densities may be installed. The order of installation id RDIMM 4, 3, 2, 1 as indicated in the planar diagram.

Total System Memory <sup>1</sup>	Quantity of RDIMMs Added		
	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)
1x256MB standard			
512MB	1	-	-
768MB	2	-	-
1GB	3	-	-
1.25GB	-	2	-
1.5GB	1	2	-
2GB	1	1	1
2.25GB	-	2	1
2.5GB	1	-	2
2.75GB	-	1	2
3GB <sup>2</sup>	-	2	2
3.25GB	-	-	3
3.5GB <sup>2</sup>	-	1	3
4GB <sup>2</sup>	-	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Select the desired total memory, then add the selection in that row to the standard memory.
2. Requires removal of standard RDIMM.

**IBM xSeries 305**





## xSeries 305 Internal SCSI Cabling

### EIDE Configurations

EIDE models include a standard CD-ROM drive attached to one connector of the IDE controller using a single-drop IDE cable and the standard IDE HDD is attached to the other IDE connector using a standard two-drop IDE cable. One additional IDE HDD may be installed in the one available HDD bay, attaching to the second drop of the standard two-drop IDE cable.

### SCSI Configurations

SCSI models include a standard single-channel PCI SCSI storage controller with one internal connector installed in slot two that attaches to a standard nonhot-swap SCSI HDD using the standard 16-bit LVD terminated two-drop SCSI cable. External SCSI devices require a supported SCSI controller. The standard CD-ROM attaches to the IDE connector using a single-drop IDE cable. In RAID configurations using a ServeRAID-4Lx controller, the HDDs are attached to the RAID controller using the standard cable.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**

## xSeries 305 Hard Disk Drive (HDD)

SCSI Models						
Total Internal Storage <sup>1</sup>	10,000rpm SCSI HDDs				15,000rpm SCSI HDDs	
	18.2GB (06P5750)	36.4GB (06P5751, 32P0723) <sup>2</sup>	73.4GB (06P5752, 32P0724) <sup>2</sup>	146.8GB (32P0728) <sup>2</sup>	18.2GB (06P5765)	36.4GB (06P5766)
18.2GB	Standard in SCSI models	-	-	-	-	-
36.4GB	1	-	-	-	1	-
72.8GB <sup>3</sup>	-	2	-	-	-	2
73.4GB <sup>3</sup>	-	-	1	-	-	-
146.8GB <sup>3</sup>	-	-	2	1	-	-
293.6GB <sup>3</sup>	-	-	-	2	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. Ultra320 HDDs are supported either mixed with an Ultra160 HDD or alone, but performance is limited to the Ultra160 speed of the SCSI controller.
3. Requires removing the standard HDD.

IDE Models				
Total Internal Storage <sup>1</sup>	7200rpm IDE HDDs <sup>2</sup>			
	40GB (22P7157)	60GB (09N4207)	80GB (09N4226)	120GB (09N4231)
40GB	Std on IDE models	-	-	-
80GB	1	-	-	-
100GB	-	1	-	-
120GB	-	-	1	-
140GB <sup>2</sup>	-	1	1	-
160GB <sup>2</sup>	-	-	2	-
200GB <sup>2</sup>	-	-	1	1
240GB <sup>2</sup>	-	-	-	2

This table does not represent all possible HDD configurations. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

1. Select a total storage row then add the quantity of HDDs from all columns to the standard HDD.
2. Requires removal of the standard HDD.

Part Number	Description	RPM	Height	Bays Supported <sup>3</sup>	Maximum Quantity
<b>IDE HDDs<sup>1</sup></b>					
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
09N4231	120GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
<b>Nonhot-swap Ultra160 SCSI HDDs<sup>1</sup></b>					
06P5750	18.2GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	1, 2	2
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	1, 2	2
06P5752	73.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	1, 2	2
06P5765	18.2GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	1, 2	2
06P5766	36.4GB 15Krpm Ultra160 SCSI SL HDD	15000	SL	1, 2	2
<b>Nonhot-swap Ultra320 HDDs<sup>1, 2</sup></b>					
32P0723	36.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	1, 2	2
32P0724	73.4GB 10Krpm Ultra320 SCSI HDD	10000	SL	1, 2	2
32P0725	146.8GB 10Krpm Ultra320 SCSI HDD	10000	SL	1, 2	2
<b>External Storage Expansion Units<sup>3</sup></b>			<b>Form Factor</b>		
35311RU	EXP300 Storage Expansion Unit <sup>4</sup>	Rack (3U)			

1. Mixing of IDE and SCSI hard disk drives is not supported.
2. Ultra320 HDDs are supported, but performance is limited to the Ultra160 speed of the SCSI controller.
3. xSeries 305 does not include an external SCSI connector. To configure a SCSI storage device, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord.



Bay	Form Factor	Height	Front Access	Usage
1 <sup>1</sup>	89mm (3.5in)	SL	no	HDD
2	89mm (3.5in)	SL	no	open

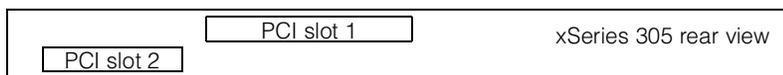
1. Boot drive should be located in bay one.



### xSeries 305 I/O Options

Part Number	Description	Adapter Length	PCI Support <sup>2</sup>	Slots Supported
<b>Storage Controllers<sup>1</sup></b>				
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>3</sup>	Half	64-bit	1
71P8592	ATA133 RAID Controller <sup>4</sup>	Half	32-bit	1
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>5</sup>	Half	32-bit	1, 2
<b>Networking<sup>6</sup></b>				
<b>Ethernet<sup>7</sup></b>				
06P3601	10/100 Ethernet Server Adapter <sup>8</sup>	Half	32-bit	1
22P4901	10/100 Dual Port Server Adapter <sup>8</sup>	Half	64-bit	1
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>8</sup>	Half	64-bit	1
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	1, 2
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>8</sup>	Half	64-bit	1, 2
<b>Token Ring</b>				
34L5001	16/4 Token-ring PCI Management Adapter <sup>8</sup>	Half	32-bit	1
07P2701	16/4 Token-ring Low Profile PCI Management Adapter <sup>8</sup>	Half	32-bit	2
<b>Communications<sup>9</sup></b>				
37L14xx	Serial I/O SST 8- and 16-port adapters <sup>10</sup>	Half	32-bit	1
<b>System Management</b>				
09N7585	Remote Supervisor Adapter <sup>11</sup>	Half	32-bit	1

1. xSeries 305 has dual integrated EIDE (ATA-100) bus master controllers. SCSI models ship standard with a single-channel Ultra160 SCSI controller installed in slot two. The SCSI controller includes a two-drop cable for connection to two internal HDDs. External connection of a SCSI device requires a supported SCSI adapter.
2. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.
3. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
4. ATA133 RAID Controller (P/N 71P8592) supports RAID levels 0 and 1 on up to two ATA66, 100 or 133 EIDE HDDs. The dual channel IDE controller includes two internal 40-pin connectors, two 18-inch single-drop IDE cables (P/N 02R0719) and two 23-inch two-drop IDE cables (P/N 02R0721).
5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and one external 0.8mm VHDCI connector. Support for external SCSI devices only. A five-drop terminated LVD SCSI cable is included but not supported for use in this server. This option includes brackets for both low-profile and full-size slots. SCSI models are equipped with the low-profile version of this adapter.
6. xSeries 305 includes dual full-duplex copper 10/100/100Mbps Broadcom Ethernet controllers.
7. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible.
8. Three optional Ethernet adapters are copper and Intel-based (P/N 06P3601, 22P4901, 22P6801). Two adapters are Broadcom-based (P/N 22P7801, 31P6301).
9. Wake on LAN function provided with this networking adapter is supported by this server.
10. xSeries 305 includes two USB ports (front of chassis), a serial port, and video, keyboard and mouse ports.
11. See Appendix E for details on Serial I/O options and configuration limitations.
11. The Remote Supervisor Adapter requires installation of the AC power adapter included with the option in order to operate in standby mode.



Slot 1: Bus 1, 64-bit, 66/100/133MHz PCI-X, full-size, half-length, 3.3v  
 Slot 2: Bus 2, 64-bit, 66/100/133MHz PCI-X, low-profile, half-length, 3.3v

Note: When two 133MHz adapters are installed, the bus will operate at a maximum frequency of 100MHz. If only one 133MHz adapter is installed, the bus will support the rated frequency of the adapter. If a lower frequency adapter is installed, the bus will be limited to the rated frequency of that adapter.



## xSeries 305 Power, Monitors & Accessories

Part Number	Description
<b>Power<sup>1</sup></b>	
<b>Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>3</sup>
2130R31	UPS3000XHV <sup>3</sup>
32P1692	UPS Extend Run Battery Pack <sup>3</sup>
37L6861	APC Smart-UPS 5000RMB <sup>4</sup>
<b>Monitors<sup>5</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>6</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>6</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>6</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>7</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>7</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>7</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>7</sup>

1. xSeries 305 includes a worldwide, voltage-sensing 200w power supply with two 9ft line cords, one with an IEC 320 C14 connector for attachment to a PDU or high-voltage UPS and one with a 110v NEMA 5-15P connector for attachment to a low-voltage UPS or wall outlet.

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

3. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.

4. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.

5. xSeries 305 includes an integrated ATI Rage XL video controller with 8MB of video memory.

6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).

7. Includes a 15in Flat Panel Monitor.

Part Number	Description
<b>Rack and NetBAY<sup>1, 2</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>3</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>4</sup></b>	
28L3644	Space Saver II Keyboard <sup>5, 6</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>7, 8</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>5, 6, 8</sup>
28L3673	Sleek 2-button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>8</sup>

1. xSeries 305 is housed in a 19in rack-mountable drawer and requires one of the racks listed in the Rack Cabinets and Options section.

2. Note limitations and restrictions for adequate cooling in the Rack Cabinets and Options section. If non-IBM racks are to be used, assure that both the front and rear doors offer a minimum of 48% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64mm (2 to 2.5in) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance.

3. Refer to the Rack Console Options section for information regarding console connectivity using these options.

4. xSeries 305 supports rack configurations only and ships without a keyboard or mouse.

5. Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).

6. Advanced TrackPoint IV features are not available on IBM xSeries systems.

7. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.

8. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.



### xSeries 305 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures <sup>1</sup>
00N7991	20/40 GB DDS/4 4mm Internal Tape Drive	-	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup> 3510020 <sup>4</sup> 0034B0X
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
59P6736	160/320GB SDLT Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3503B1X 0034B0X
<b>Tape Autoloaders</b>						
00N7992	120/240GB DDS/4 Tape Autoloader	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
360716X	3607 Series 1760GB/3.5TB SDLTpro Tape Autoloader	-	16 Ultra2 LVD	2U Rack	Y	-
<b>External Tape Enclosures</b>						
0034B0X	NetBAY Tape Enclosure (Rack Mount) <sup>5</sup>	-	16 Ultra2 LVD	4U Rack	N	-
3510020	External Half High SCSI Storage Enclosure <sup>6</sup>	-	16 LVD	Desktop	N	-
3503B1X	Full-High SCSI Tape Enclosure <sup>7</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-
3551001	NetMEDIA Storage Expansion Unit EL <sup>8</sup>	-	16 LVD	Rack	Y	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext	Y	3510020

1. xSeries 305 does not support internal tape drives and does not include an external SCSI connector. An external tape library or internal tape drive with a tape enclosure, supported SCSI adapter and appropriate cable must be selected. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646), which has an external 0.8mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables - Storage Units - Controllers to select an appropriate external cable.
2. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.
3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
5. This 4U rack-mounted enclosure supports four full-high or six half-high tape drives. The backplate includes six 0.8mm VHDCI external connectors for attachment of up to six servers. Internal connection of tape drives requires the single-drop terminated LVD SCSI cable that ships with the tape drive, which also provides termination for the SCSI bus. A single 300w power supply with a low-voltage power cord is standard. An external SCSI storage cable is not provided. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
7. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. \*Supports the following full-high tape options: 00N8015, 00N8016, 00N7992.
8. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes



## xSeries 305 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### Caching Server<sup>1</sup>

Part Number	Description	Quantity
8673-13X	xSeries 305 2GHz-512KB/400MHz Pentium 4, 256MB ECC, 18.2GB, 24x (1U rack)	1
33L5039	1GB DDR PC2100 ECC RDIMM	2 <sup>2</sup>
06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	1 <sup>3</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard)	1
32P1020	APC 2U Smart-UPS 1400 RMB	1

1. Rack components are not included.

2. Total memory is 2GB. Removal of the standard 256MB RDIMM is required.

3. For a total of 54.6GB of internal storage.

### Static Web Content Server<sup>1</sup>

Part Number	Description	Quantity
8673-12X	xSeries 305 2GHz-512KB/400MHz Pentium 4, 256MB ECC, 40GB EIDE, 24x (1U rack)	1
33L5037	256MB DDR PC2100 ECC RDIMM	3 <sup>2</sup>
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	2 <sup>3</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard)	1
32P1020	APC 2U Smart-UPS 1400 RMB	1

1. Rack components are not included.

2. For a total of 1GB of system memory.

3. For a total of 160GB of internal storage. Removal of the standard IDE HDD is required.



# IBM xSeries 335

## EMEA Part Number Cross Reference

xSeries 335 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
P641Xxx	867641X	8676-41X	Xeon 2.0MHz/400GHz, 512KB, 512MB, Open Bay U320, Rack	---
P642Xxx	867642X	8676-42X	Xeon 2.0GHz/400MHz, 512KB, 512MB, 40GB EIDE, Rack	---
P661Xxx	867661X	8676-61X	Xeon 2.4GHz/400MHz, 512KB, 512MB, Open Bay U320, Rack	---
P662Xxx	867662X	8676-62X	Xeon 2.4GHz/400MHz, 512KB, 512MB, 40GB EIDE, Rack	---
P671Xxx	867671X	8676-71X	Xeon 2.6GHz/400MHz, 512KB, 512MB, Open Bay U320, Rack	---
P672Xxx	867672X	8676-72X	Xeon 2.6GHz/400MHz, 512KB, 512MB, 40GB EIDE, Rack	---
P681Xxx	867681X	8676-81X	Xeon 2.8GHz/400MHz, 512KB, 512MB, Open Bay U320, Rack	---
P682Xxx	867682X	8676-82X	Xeon 2.8GHz/400MHz, 512KB, 512MB, 40GB EIDE, Rack	---
P611Xxx	867611X	8676-11X	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay U320, Rack	---
P612Xxx	867612X	8676-12X	Xeon 2.8GHz/533MHz, 512KB, 512MB, 40GB EIDE, Rack	---
P61AXxx	86761AX	8676-1AX	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay U320, DC Power, Rack	---
P061Xxx	883061X	8830-61X	Xeon 2.4GHz/400MHz, 512KB, 512MB, Open Bay U320, One-year Warranty, Rack	---
P062Xxx	883062X	8830-62X	Xeon 2.4GHz/400MHz, 512KB, 512MB, 40GB EIDE, One-year Warranty, Rack	---
P081Xxx	883081X	8830-81X	Xeon 2.8GHz/400MHz, 512KB, 512MB, Open Bay U320, One-year Warranty, Rack	---
P082Xxx	883082X	8830-82X	Xeon 2.8GHz/400MHz, 512KB, 512MB, 40GB EIDE, One-year Warranty, Rack	---
P011Xxx	883011X	8830-11X	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay U320, One-year Warranty, Rack	---
P012Xxx	883012X	8830-12X	Xeon 2.8GHz/533MHz, 512KB, 512MB, 40GB EIDE, One-year Warranty, Rack	---

xSeries 335 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2  
Notes 6&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

# IBM xSeries 335

## EMEA Part Number Cross Reference

### xSeries 335 I/O Option Part Numbers

	EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
Note 7	09N75xx	09N7585	---	Remote Supervisor Adapter	---

7. Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA..

### xSeries 335 Power, Monitors & Accessories

	EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
Note 9	32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 10	32P1681	2130R30	---	UPS3000XLV	---
Note 11	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

8. The xSeries 335 ships with one standard country power cord and one Rack Power cord for connection either to a wall socket or a high voltage UPS or PDU.

9. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

10. Only available in Saudi Arabia.

11. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

### xSeries 335 Power, Monitors & Accessories

	EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
Note 12	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 12	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 12	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

12. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

### xSeries 335 Power, Monitors & Accessories

	EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
Note 13	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 14	10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
Note 15	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
	28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

13. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

14. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

15. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

### xSeries 335 Tape Options

	EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
Note 16	59P67xx	0034B0X	---	NetBAY Tape Enclosure (4U Rack mount)	---
	03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---
Note 17	24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---

16. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

17. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 335

Part Number<sup>1</sup>  
 Processor Speed (GHz)  
 Number of Processors (Std/Max)<sup>2</sup>  
 L2 ECC Cache (KB)  
 Memory (Std/Max)<sup>4</sup>  
 Form Factor  
 Power Supply Quantity (Std/Max)<sup>5</sup>  
 Hot-Swap (Power, Slots, HDD, Fans)  
 Redundancy (Optional, Standard)  
 System Management Processor  
 Onboard Ethernet (Mbps)<sup>7</sup>  
 Storage Controller (Dual, Ultra, RAID)  
 Removable Media Bays (Total/Avail)  
 Internal HDD Storage (Std/Max)  
 CD-ROM (IDE)<sup>11</sup>  
 Bays (Total/Avail)  
 Slots (Total/Avail)

xSeries 335 At-A-Glance																
8676-41X	2 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8676-42X	2 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8676-61X	2.4 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8676-62X	2.4 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8676-71X	2.6 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8676-72X	2.6 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8676-81X	2.8 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8676-82X	2.8 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8676-11X	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8676-12X	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8676-1AX <sup>6</sup>	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1 <sup>6</sup>	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8830-61X <sup>12</sup>	2.4 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8830-62X <sup>12</sup>	2.4 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8830-81X <sup>12</sup>	2.8 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8830-82X <sup>12</sup>	2.8 <sup>2</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2
8830-11X <sup>12</sup>	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	U320 <sup>8</sup>	2/0	0/293.6GB <sup>9</sup>	24x-10x	4/2	2/2
8830-12X <sup>12</sup>	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Rack (1U)	1/1	-	-	Y	2x10/100/1000	IDE	2/0	40GB/240GB <sup>10</sup>	24x-10x	4/1	2/2

1. Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. See Rack Cabinets and Options section for supported IBM racks.  
 2. Intel Xeon processor with advanced transfer L2 cache and 400MHz (quad-pumped) Front-side Bus (FSB). Not compatible with 533MHz FSB models.  
 3. Intel Xeon processor with advanced transfer L2 cache and 533MHz (quad-pumped) FSB. Not compatible with 400MHz FSB models.  
 4. Two 256MB RDIMMs are standard, supporting two-way interleaving and Chipkill technology.  
 5. A single 332w power supply is standard. Redundancy and hot-swap are not supported.  
 6. Includes a -48v to -60v 332w power supply designed for telecommunications applications.  
 7. Broadcom 5703 integrated dual gigabit Ethernet controllers.  
 8. The single-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not used to support the internal HDDs.  
 9. Maximum capacity requires installing two 146.8GB SCSI HDDs. Mixing of Ultra320 and Ultra160 HDDs is supported, but the bus will operate at the speed of the lowest rated HDD.  
 10. Maximum capacity requires removing the standard IDE HDD and installing two 120GB IDE HDDs.  
 11. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.  
 12. This model includes a one-year parts and labor warranty rather than the standard three-year warranty.

**xSeries 335 Processors**

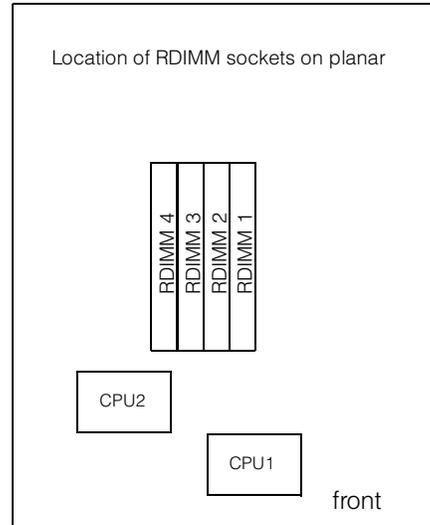
Part Number	Processor Upgrades	SMP Support <sup>1</sup>
59P5100	2GHz/400MHz-512KB L2 Cache Xeon Processor	4xX
59P5102	2.4GHz/400MHz-512KB L2 Cache Xeon Processor	6xX
02R8957	2.6GHz/400MHz-512KB L2 Cache Xeon Processor	7xX
02R8958	2.8GHz/400MHz-512KB L2 Cache Xeon Processor	8xX
73P6382	2.8GHz/533MHz-512KB L2 Cache Xeon Processor	1xX

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed and cache size.

**xSeries 335 Memory**

Part Number	Memory Description <sup>1</sup>
33L5037	256MB DDR PC2100 ECC RDIMM
33L5038	512MB DDR PC2100 ECC RDIMM
33L5039	1GB DDR PC2100 ECC RDIMM
33L5040	2GB DDR PC2100 ECC RDIMM

1. Due to two-way interleaving, installation of memory options in pairs is required. Standard RDIMMs are installed in sockets one and two. One RDIMM pair is not required to match the other. Provides Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill (corrects 1, 2, 3, or 4-bit errors on the same chip and detects 2- through 8-bit errors contained in two chips).



Total System Memory <sup>1</sup>	Quantity of RDIMMs Added			
	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)	2GB (33L5040)
1GB	2	-	-	-
1.5GB	-	2	-	-
2GB <sup>2</sup>	-	-	2	-
2.5GB	-	-	2	-
3GB <sup>2</sup>	-	2	2	-
4GB <sup>2</sup>	-	-	4	-
5GB <sup>2</sup>	-	2	-	2
6GB <sup>2</sup>	-	-	2	2
8GB <sup>2</sup>	-	-	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

- 1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information
- 2. Requires removal of standard memory.

IBM xSeries 335



## xSeries 335 Internal SCSI Cabling

### EIDE Configurations

EIDE models include a standard CD-ROM drive attached to one connector of the IDE controller using a single-drop IDE cable and the standard IDE HDD is attached to the other IDE connector using a standard two-drop IDE cable. One additional IDE HDD may be installed in the one available HDD bay, attaching to the second drop of the standard two-drop IDE cable.

### SCSI Configurations

xSeries 335 hot-swap SCSI models support two hot-swap SCSI HDDs on a DASD backplane. The backplane is connected to the integrated Ultra320 single-channel controller through a 16-bit nonterminated SCSI cable. Attachment of external SCSI devices require a supported optional SCSI PCI controller. The standard CD-ROM is attached to the IDE connector using a single-drop IDE cable.

RAID configurations are supported by the integrated LSI chipset, which provides onboard mirroring. Optional ServeRAID-4Lx or -4Mx controllers can be installed to support the internal HDDs, in which case the standard cable would be used to attach the backplane to the RAID controller.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**

## xSeries 335 Hard Disk Drive (HDD)

SCSI Models							
Total Internal Storage <sup>1</sup>	10,000rpm SCSI HDDs				15,000rpm SCSI HDDs		
	18.2GB (06P5754)	36.4GB (06P5755, 32P0726) <sup>2</sup>	73.4GB (06P5756, 32P0727) <sup>2</sup>	146.8GB (32P0728) <sup>2</sup>	18.2GB (06P5767)	36.4GB (32P0734, 06P5768, 06P5776) <sup>4</sup>	73.4GB (32P0735)
0GB	Standard in base models						
18.2GB	1	-	-	-	1	-	-
36.4GB	2	1	-	-	2	1	-
72.8GB	-	2	-	-	-	2	-
73.4GB	-	-	1	-	-	-	1
146.8GB	-	-	2	-	-	-	2
293.6GB (max)	-	-	-	2	-	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

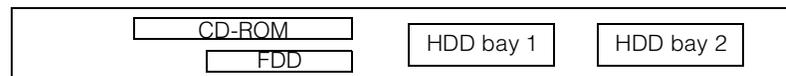
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. When Ultra320 and Ultra160 HDDs are installed in the same SCSI bus, performance is limited to Ultra160 speeds.

EIDE Models				
Total Internal Storage <sup>1</sup>	7200rpm EIDE HDDs			
	40GB (22P7157)	60GB (09N4207)	80GB (09N4226)	120GB (09N4231)
40GB	Std in IDE models	-	-	-
80GB	1	-	-	-
100GB	-	1	-	-
120GB	-	-	1	-
140GB <sup>2</sup>	-	1	1	-
160GB	-	-	-	1
180GB <sup>2</sup>	-	1	-	1
200GB <sup>2</sup>	-	-	1	1
240GB <sup>2</sup>	-	-	-	2

1. Select a total storage row then add the HDDs from all columns to the standard HDD.
2. Requires replacing the standard HDD.

Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
<b>IDE HDD<sup>1, 2</sup></b>					
22P7157	40GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
09N4207	60GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
09N4226	80GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
09N4231	120GB 7200rpm ATA-100 (EIDE) HDD	7200	SL	1, 2	2
<b>Hot-swap Ultra160 HDDs<sup>1, 3</sup></b>					
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	1, 2	2
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	1, 2	2
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	1, 2	2
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	1, 2	2
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	1, 2	2
<b>Hot-swap Ultra320 HDDs<sup>1, 3</sup></b>					
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1, 2	2
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1, 2	2
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1, 2	2
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-Swap SL HDD	15000	SL	1, 2	2
32P0734	36.4GB 15Krpm Ultra320 SCSI Hot-Swap HDD	15000	SL	1, 2	2
32P0735	73.4GB 15Krpm Ultra320 SCSI Hot-Swap HDD	15000	SL	1, 2	2
<b>External USB Drives</b>					
05K9276	USB Portable Diskette Drive	-			
33L5151	USB Portable CD-ROM Drive	-			
<b>External Storage Expansion Units<sup>4</sup> Form Factor</b>					
35311RU	EXP300 Storage Expansion Unit <sup>5</sup>		Rack (3U)		
17401RU	FAST EXP700 Storage Expansion Unit <sup>6</sup>		Rack (3U)		
35601RU	FAST EXP500 Storage Expansion Unit <sup>7</sup>		Rack (3U)		
35421RU	FAST200 Storage Server <sup>8, 9</sup>		Rack (3U)		
35422RU	FAST200 HA Storage Server <sup>8</sup>		Rack (3U)		
19K1121	FAST200 Redundant RAID Controller		-		

- Mixing of IDE and SCSI hard disk drives is not supported.
- Nonhot-swap HDDs are supported only in IDE models.
- Hot-swap HDDs are supported only in hot-swap models.
- xSeries 335 does not include an external SCSI connector. To configure a SCSI storage device, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.
- EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord.
- FAST EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.
- FAST EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350w power supplies, each with its own power cord.
- The FAST200 includes two hot-swap, 350w auto-ranging redundant power supplies, each with its own power cord.
- Can be upgraded to FAST200 HA Storage Server through the addition of a FAST200 Redundant RAID Controller (P/N 19K1121).



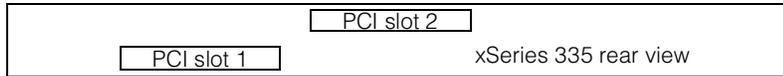
xSeries 335 front view

Bay	Form Factor	Height	Front Access	Usage
1 <sup>1</sup>	HS or 89mm (3.5in) <sup>2</sup>	SL	yes <sup>3</sup>	open
2	HS or 89mm (3.5in) <sup>2</sup>	SL	yes <sup>3</sup>	open

- Boot drive should be located in bay one.
- x335 supports IDE and hot-swap models.
- Bays one and two are not front-accessible in IDE models, which include one IDE HDD in bay one.



**xSeries 335 I/O Options**



Slot 1: Bus 2, 100MHz, 64-bit, 3.3v, half-length, PCI-X  
 Slot 2: Bus 1, 100MHz, 64-bit, 3.3v, full-length, PCI-X

Part Number	Description	Adapter Length	PCI Support <sup>3</sup>	Slots Supported <sup>3</sup>	Hot-Plug	PCI Voltage Key	MHz
<b>Storage Controllers<sup>1, 2</sup></b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	2	-	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	2	-	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>6</sup>	Half	64-bit	1, 2	-	Universal	66
71P8592	ATA133 RAID Controller <sup>7</sup>	Half	32-bit	1, 2	-	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>8</sup>	Half	32-bit	1, 2	-	Universal	33
<b>Fibre Storage Controllers and Options<sup>9</sup></b>							
00N6881	FAST Host Adapter	Half	64-bit	1, 2	-	Universal	66
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	1, 2	-	Universal	133
17421RU	FAST700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FAST500 Storage Server	-	-	-	-	-	-
35421RU	FAST200 Storage Server	-	-	-	-	-	-
35422RU	FAST200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>10</sup>	-	-	-	-	-	-
<b>Networking<sup>11</sup></b>							
<b>Ethernet<sup>12</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>13</sup>	Half	32-bit	1, 2	-	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>13</sup>	Half	64-bit	1, 2	-	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>13</sup>	Half	64-bit	1, 2	-	Universal	133
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	1, 2	-	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>13</sup>	Half	64-bit	1, 2	-	Universal	133
<b>Token Ring</b>							
34L5001	16/4 Token-Ring PCI Management Adapter <sup>13</sup>	Half	32-bit	1, 2	-	Universal	33
34L5201	High-speed 100/16/4 Token-Ring PCI Management Adapter <sup>13</sup>	Half	32-bit	1, 2	-	Universal	33
<b>Communications<sup>14</sup></b>							
<b>System Management<sup>15</sup></b>							
09N7585	Remote Supervisor Adapter <sup>16</sup>	Half	32-bit	1	-	Universal	33

1. xSeries 335 has a single-channel, Ultra320 integrated controller that supports both Ultra 160 and Ultra320 HDDs. The entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed.  
 2. If a RAID controller is installed in either slot one or two, the boot media must be attached to it. If two RAID controllers are installed, the boot media must be attached to the controller in slot one. If two non-RAID storage controllers are installed, the BIOS for the integrated storage controller must be disabled, i.e., it cannot support either external or internal storage media.  
 3. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot. 33MHz adapters will reduce 66MHz buses to 33MHz. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.  
 4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache. The internal connectors are not accessible due to a cabling interference. Four external Ultra160 0.8mm VHDCI connectors are available.  
 5. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connections are 0.8mm VHDCI.  
 6. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.  
 7. ATA133 RAID Controller (P/N 71P8592) supports RAID levels 0 and 1 on up to two ATA66, 100 or 133 EIDE HDDs. The dual channel IDE controller includes two internal 40-pin connectors, two 18-inch single-drop IDE cables (P/N 02R0719) and two 23-inch two-drop IDE cables (P/N 02R0721).  
 8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and one external 0.8mm VHDCI connector. Support for external SCSI devices only. A five-drop terminated LVD SCSI cable is included but not supported for use in this server.  
 9. See the Fibre Channel Solutions Overview section for additional configuration information.  
 10. The 2108R3L SAN Data Gateway Router UltraSCSI LVD Port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).



11. xSeries 335 includes dual full-duplex copper 10/100/1000Mbps Broadcom 5703 Ethernet controllers.
12. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Three optional Ethernet adapters are copper and Intel-based (P/N 06P3601, 22P4901, 22P6801). Two adapters are Broadcom-based (22P7801, 31P6301).
13. The Wake on LAN function of this option is supported.
14. xSeries 335 includes four USB ports (two each on both front and rear), a high-speed serial/asynchronous port (NS16550A compatible), one RS-485 port, and in/out C2T Interconnect connectors.
15. xSeries 335 has one integrated RS-485 system management interconnect port located on the back of the system chassis. Connection of the standard service processor to servers other than xSeries 335 in an interconnect network requires a customer-supplied Cat5 Ethernet cable. Connection to other xSeries 335 servers can also be achieved through the C2T Interconnect chaining cables, which transmits both console connectivity and system management functionality.
16. When installed in an xSeries 335, Remote Supervisor Adapter (RSA) shares functionality with the integrated service processor and serves as interface for both. An external Cat5 connection between RSA and the integrated service processor using the dongle (pigtail cable) and short Cat5 cable supplied with RSA is required in addition to connection of the 20-pin ribbon cable to the planar if the server is acting as focal point in a system management interconnect network, which indicates it is the first server in a chain of x335 systems. Connection of the external AC power supply provided with RSA is not required.

### xSeries 335 Power, Monitors & Accessories

Part Number	Description
<b>Power<sup>1</sup></b>	
<b>Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>3</sup>
2130R31	UPS3000XHV <sup>3</sup>
32P1692	UPS Extend Run Battery Pack <sup>3</sup>
37L6861	APC Smart-UPS 5000RMB <sup>4</sup>
<b>Monitors<sup>5</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>6</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>6</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>6</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>7</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>7</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>7</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>7</sup>

1. xSeries 335 models include a worldwide, voltage-sensing 332w power supply with auto-restart and two 9ft line cords, one with an IEC 320 C14 connector for attachment to a PDU or high-voltage UPS and one with a 110v NEMA 5-15P connector for attachment to a low-voltage UPS or wall outlet.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.
4. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.
5. xSeries 335 includes an integrated ATI Rage XL SVGA controller with 8MB of video memory.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Includes a 15in Flat Panel Monitor.

Part Number	Description
<b>Rack and NetBAY<sup>1, 2</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>3</sup></b>	
06P4792	C2T Interconnect Cable Chain Technology Cable Kit <sup>4</sup>
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1637	C2T Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>5</sup></b>	
28L3644	Space Saver II Keyboard <sup>6, 7</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>8, 9</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>6, 7, 9</sup>
28L3673	Sleek 2-button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>9</sup>



- xSeries 335 is housed in a 19in rack-mountable drawer and requires one of the racks listed in the Rack Cabinets and Options section.
- Note limitations and restrictions required for adequate cooling in the Rack Cabinets and Options section. If non-IBM racks are to be used, assure that both front and rear doors offer a minimum of 48% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64mm (2 to 2.5in) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance.
- Refer to the Rack Console Options section for information regarding console connectivity using these options.
- A C2T Interconnect Cable Chain Technology Cable Kit (P/N 06P4792) may be used for the attachment of console devices to one or multiple chained xSeries 335s. The kit contains a 2m (6.5ft) breakout cable for attachment to a keyboard, mouse and monitor as well as a 2m (6.5ft) chaining cable for connecting two xSeries 335s together when the standard 260mm (10in) chaining cable is not long enough. A maximum of 42 xSeries 335s are supported in a single chain. No more than one Cable Chain Technology Cable Kit may be used. If the last server in the chain is connected to a console switch rather than directly to a monitor, a console cable (P/N 09N4293 or 94G7447) is required in addition to the cable kit. System management interconnect network functionality is transmitted between x335 systems through the C2T Interconnect cable.
- xSeries 335 supports rack configurations only and ships without a keyboard or mouse.
- Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).
- Advanced TrackPoint IV features are not available on IBM xSeries systems.
- Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.
- USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.

### xSeries 335 Tape Options

Part Number	Tape Drives	Bays Supported <sup>1</sup>	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures <sup>1</sup>
00N7991	20/40 GB DDS/4 4mm Internal Tape Drive	-	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup>
00N7990	40/80GB DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
24P2396	100/200GB LTO Half-High Tape Drive <sup>7</sup>	-	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup>
24P2398	40/80GB Half-High DLT/VS Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup>
59P6736	160/320GB SDLT Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3503B1X 0034B0X
<b>Tape Autoloaders</b>						
00N7992	120/240GB DDS/4 Tape Autoloader	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
<b>External Tape Enclosures</b>						
0034B0X	NetBAY Tape Enclosure (Rack Mount) <sup>4</sup>	-	16 Ultra2 LVD	4U Rack	N	-
3551001	NetMEDIA Storage Expansion Unit EL <sup>5</sup>	-	16 LVD	Rack	Y	-
3503B1X	Full-High SCSI Tape Enclosure <sup>6</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-

- xSeries 335 does not support internal tape drives and does not include an external SCSI connector. An external tape library or internal tape drive with a tape enclosure, supported SCSI adapter and appropriate cable must be selected. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables - Storage Units - Controllers to select an appropriate external cable.
- Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.
- LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.
- This 4U rack-mounted enclosure supports four full-high or six half-high tape drives. The backplate includes six 0.8mm VHDCI external connectors for attachment of up to six servers. Internal connection of tape drives requires the single-drop terminated LVD SCSI cable that ships with the tape drive, which also provides termination for the SCSI bus. A single 300w power supply with a low-voltage power cord is standard. An external SCSI storage cable is not provided. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
- NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.
- Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016, 00N7992, 00N7990.
- This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes



## xSeries 335 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### Web Content Server1

Part Number	Description	Quantity
8676-41X	xSeries 335 2GHz/512KB Xeon, 512MB ECC, open, 24x (1U rack)	1
59P5100	xSeries 2GHz 400MHz 512KB L2 Cache Xeon Processor	1
33L5037	256MB DDR PC2100 ECC RDIMM	2 <sup>2</sup>
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	2 <sup>3</sup>
09N7585	Remote Supervisor Adapter	1
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black	1
28L3644	Space Saver II Keyboard	1
32P1020	APC 2U Smart-UPS 1400RMB	1

1. Rack components are not included.
2. Total memory is 1GB.
3. Total Internal storage is 72.8GB.

### Linux Cluster Node1

Part Number	Description	Quantity
8676-61X	xSeries 335 2.4GHz/512KB Xeon, 512MB ECC, open, 24x (1U rack)	1
59P5102	xSeries 2.4GHz 400MHz 512KB L2 Cache Xeon Processor	1
33L5039	1GB DDR PC2100 ECC RDIMM	4 <sup>2</sup>
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	1
09N7585	Remote Supervisor Adapter	1
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black	1
28L3644	Space Saver II Keyboard	1
32P1020	APC 2U Smart-UPS 1400RMB	1

1. Rack components are not included.
2. For a total of 4GB of system memory. Requires removal of the standard pair of RDIMMs.

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## IBM xSeries 343

### EMEA Part Number Cross Reference

xSeries 343 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
882714X	882714X	8827-14X	P4 1.8GHz/400MHz, 512KB, 256MB, 40GB EIDE, Rack	---

Note 1

xSeries 343 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---

Note 2

1. The power cord for the xSeries 343 is customer-supplied.
2. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa /Pakistan, CH=Switzerland, UK=UK, EU=Europe.

xSeries 343 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
28L36xx	28L3644	---	Spacesaver II Keyboard	---
28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

Note 3

3. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.



# IBM xSeries 343 (NEBS-compliant)

Part Number	Processor Speed (GHz)	Number of Processors (Std/Max)	L2 ECC Cache (KB)	Memory (Std/Max)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal HDD Storage (Std/Max)	CD-ROM (IDE) <sup>7</sup>	Bays (Total/Avail) <sup>8</sup>	Slots (Total/Avail) <sup>8</sup>
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## xSeries 343 At-A-Glance

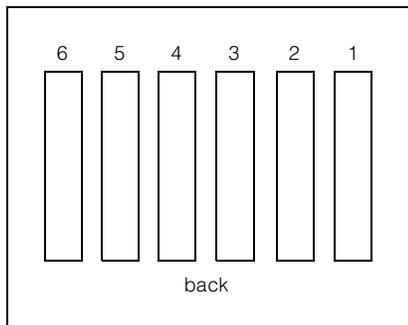
8827-14X <sup>1, 2</sup>	1.26 <sup>3</sup>	2/2	512	2GB/6GB	Rack (2U)	2/2 <sup>4</sup>	P	S-Power	Y	2 x 10/100	D, U160 <sup>5</sup>	-	36.4GB/72.8GB <sup>6</sup>	24x-10x	4/1	6/6
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- This system is Network Equipment Building System (NEBS) Level 3 compliant and includes two 350w, -48v direct current (DC) power supplies requiring a direct current power source (-48v to -60v) for utilization in a telecommunications network infrastructure.
- Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. Requires two-post rack; not supported for installation in standard IBM racks.
- Intel Pentium III processor with 133MHz FSB and 512KB advanced transfer cache.
- Includes two standard 350w, -48v direct current (DC) hot-swap, redundant power supplies.
- Includes an integrated dual-channel Ultra160 SCSI controller supporting both internal and external SCSI attachment.
- One 10,000rpm 36.4GB Ultra160 HDD ships standard with this specific NEBS configuration. Please contact your IBM representative, Business Partner or the IBM Help Center with questions regarding different NEBS configurations. This system does not support hot-swap HDDs.
- Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
- Optional third-party PCI networking adapters are supported on this system. Refer to ServerProven test results for supported third-party options at [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat). Select x343 from the Fast Access pulldown menu, click Go, then select the appropriate categories on the following screen. IBM makes no representations or warranties with respect to non-IBM products. These products are offered and warranted by third parties, not IBM.

## xSeries 343 Memory

Part Number	Memory Description <sup>1</sup>
33L3324	512MB PC133 ECC SDRAM RDIMM
33L3326	1GB PC133 ECC SDRAM RDIMM

1. Due to two-way interleaving, installation of memory options in pairs beginning with sockets one and four is required. Add memory options in sockets two and five, then three and six.



Total System Memory <sup>1</sup>	Quantity of RDIMMs Added <sup>2</sup>	
	512MB (33L3324)	1GB (33L3326)
<b>2GB (2 x 1GB) Standard</b>		
3GB	2	-
4GB	4	-
5GB	2	2
6GB	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs. RDIMMs must be added in pairs to support interleaving technology.

- Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
- Add options from both columns in each row to the standard memory.



### xSeries 343 Internal SCSI Cabling

The xSeries 343 contains four drive bays. The top bay on the left contains the standard CD-ROM drive and the bay beneath contains the standard 1.44MB, 3.5in slim-line diskette drive. Two 3.5in slim-line bays are located side-by-side, one beneath the CD-ROM and FDD at the bottom of the chassis and the other directly beside it on the right side of the server.

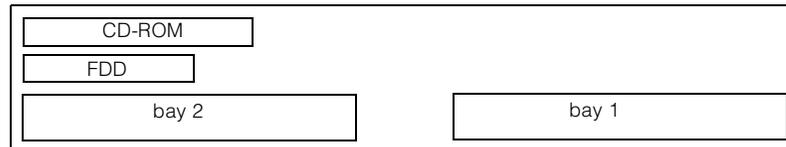
One bay contains the standard 10,000rpm, Ultra160 SCSI nonhot-swap HDD and the other is unpopulated. The 24x-10x IDE CD-ROM is connected to the IDE port. HDDs installed in the drive bays are connected to the internal connector of the integrated Ultra160 SCSI controller through a two-drop, 16-bit LVD SCSI cable. The xSeries 343 contains an external 0.8mm VHDCI connector to attach supported external SCSI devices to the second channel of the integrated SCSI controller.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**

### xSeries 343 Hard Disk Drive (HDD) Storage

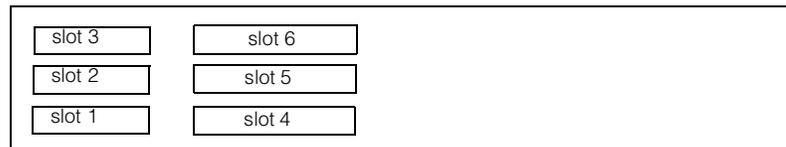
Bay	Form Factor	Height	Front Access	Usage	Part Number	Description	RPM	Height	Bays Supported	Max Qty
-	133mm (5.25in)	-	yes	IDE CD-ROM	<b>Ultra160 Hard Disk Drives (HDD)</b>					
-	89mm (3.5in)	-	yes	Diskette	06P5751	36.4GB 10Krpm Ultra160 SCSI SL HDD	10000	SL	1, 2 <sup>1</sup>	2
1	89mm (3.5in)	SL	No	std HDD	1. xSeries 343 ships with a 36.4GB 10,000rpm nonhot-swap HDD installed in bay one.					
2	89mm (3.5in)	SL	No	open						

front of chassis



### xSeries 343 I/O Options

rear of chassis



- slot 1: bus 1, low profile, 64-bit, 66MHz, 3.3v, half-length
- slot 2: bus 1, low profile, 64-bit, 66MHz, 3.3v, half-length
- slot 3: bus 1, low profile, 64-bit, 66MHz, 3.3v, half-length
- slot 4: bus 2, full-size, 64-bit, 33MHz, 5v, full-length
- slot 5: bus 2, full-size, 64-bit, 33MHz, 5v, full-length
- slot 6: bus 2, full-size, 64-bit, 33MHz, 5v, full-length

Note: Optional third-party PCI networking adapters are supported on this system. Refer to ServerProven test results for supported third-party options at [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat). Select x343 from the Fast Access pulldown menu, click Go, then select the appropriate categories on the following screen. IBM makes no representations or warranties with respect to non-IBM products. These products are offered and warranted by third parties, not IBM.

IBM xSeries 343  
(NEBS-compliant)



### xSeries 343 Power, Monitors & Accessories

Part Number	Description
<b>Power<sup>1</sup></b>	
<b>Monitors<sup>2</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>3</sup>

1. xSeries 343 systems include two 350w, -48v direct current (DC) power supplies requiring a direct current power source (-48v to -60v). Power cord is customer-supplied.
2. xSeries 343 uses an ATA Rage XL SVGA controller with 8MB of video memory.
3. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).

Part Number	Description
<b>Rack and NetBAY<sup>1</sup></b>	
<b>Keyboard and Mouse<sup>2</sup></b>	
28L3644	Space Saver II Keyboard <sup>3</sup>
28L3673	Sleek 2-button Stealth Black Mouse

1. xSeries 343 is housed in a 19in rack-mountable drawer and requires a two-post rack. Not supported for installation in standard IBM racks.
2. xSeries 343 supports rack configurations only and ships without a mouse or keyboard.
3. Installation within a rack requires optional keyboard tray (P/N 28L4707), which stows in ready-to-use position.





# IBM xSeries 345

## EMEA Part Number Cross Reference

xSeries 345 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
K011Xxx	867011X	8670-11X	Xeon 2.0GHz/400MHz, 512KB, 512MB, Open Bay U320 HS, Rack	---
K031Xxx	867031X	8670-31X	Xeon 2.4GHz/400MHz, 512KB, 512MB, Open Bay U320 HS, Rack	---
K051Xxx	867051X	8670-51X	Xeon 2.67GHz/533MHz, 512KB, 512MB, Open Bay U320 HS, Rack	---
K061Xxx	867061X	8670-61X	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay U320 HS, Rack	---

xSeries 345 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2  
Notes 6&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 345 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION FIBRE STORAGE OPTIONS	EMEA WDFM DATE
71P81xx	174290U	---	FAST900 Storage Server	---
24P09xx	17421RU	---	FAST700 Storage Server	---
00N69xx	35521RU	---	FAST500 Storage Server	---
19K11xx	35421RU	---	FAST200 Storage Server	---
19K11xx	35422RU	---	FAST200 HA Storage Server	---

Notes 2&F1  
Notes 2&F2  
Notes 2&F3  
Notes 2&F4  
Notes 2&F5

- Where 'xx' represents a specific country code as follows: 29=Euro/English, 30=Euro/Spanish, 31=Euro/French, 32=Euro/German, 33=Danish/, 34=Israel/English, 35=Italy/English, 36=South Africa/English, 37=Swiss/English, 38=Swiss/French, 39=Swiss/German, 40=UK/English.
- Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.
- Where 'xx' represents a specific country code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 345 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION PCI	EMEA WDFM DATE
22P6550	19K4162	---	V90 PCI Data/Fax WinModem	---
N/A	33L4618	---	V90 PCI Data/Fax WinModem	N/A
09N75xx	09N7585	---	Remote Supervisor Adapter	---

Note 7

- Where 'xx' represents a specific country code as follows:- 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA..

# IBM xSeries 345

## EMEA Part Number Cross Reference

xSeries 345 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE	
Note 9	32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 10	32P1681	2130R30	---	UPS3000XLV	---
Note 11	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

8. The xSeries 345 ships with a standard country power cord. For connection to a high voltage UPS or PDU, order Rack Power Cable P/N 94G7448.

9. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

10. Only available in Saudi Arabia.

11. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

xSeries 345 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE	
Note 12	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 12	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 12	T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

12. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

xSeries 345 Power, Monitors & Accessories					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE	
Note 13	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 14	10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
Note 15	22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
Note 16	31P74xx	31P7415	---	Preferred Pro Full-Size Keyboard - 104 keys (S/Black)	---
	28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

13. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portuguese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

14. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

15. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

16. Where 'xx' represents a specific country code as follows:- 16=Arabia, 17=Belg/Fre, 18=Belg/UK, 19=Bulgaria, 21=Czech Republic, P/N 31P8767=Czech/US, 22=Denmark, 23=Netherlands, 24=France, 27=Germany, 28=Greece, 29=Israel, 30=Hungary, 31=Iceland, 32=Italy, P/N 31P8250=Italian 141, 36=Norway, 37=Poland, 38=Portugal, 39=Romania, 40=Russia, 41=Rus/Cyrillic, 42=Serb/Cyrillic, 43=Slovak, 44=Spanish, 45=Sweden/Finland, 46=Switzerland, 48=Turkey 440, 49=Turkey 179, 50=UK English, 51=US/Euro, 52=Yugoslavia/La

xSeries 345 Tape Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
Note 17	00N79xx	360716X	---	3607 Series 1760GB/3.5TB SDLT pro Tape Autoloader	---
Note 18	59P67xx	0034B0X	---	NetBAY Tape Enclosure (4U Rack mount)	---
	10L7440	3510020	---	External Half High SCSI Storage Enclosure	---
Note 19	24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---
	03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---

17. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

18. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

19. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 345

Part Number<sup>1</sup>  
 Processor Speed (GHz)  
 Number of Processors (Std/Max)<sup>2</sup>  
 L2 ECC Cache (KB)  
 Memory (Std/Max)<sup>4</sup>  
 Form Factor  
 Power Supply Quantity (Std/Max)  
 Hot-Swap (Power, Slots, HDD, Fans)  
 Redundancy (Optional, Standard)<sup>5</sup>  
 System Management Processor  
 Onboard Ethernet (Mbps)  
 SCSI Controller (Dual, Ultra, RAID)<sup>6</sup>  
 Removable Media Bays (Total/Avail)<sup>7</sup>  
 Internal HDD Storage (Std/Max)<sup>8</sup>  
 CD-ROM (IDE)<sup>9</sup>  
 Bays (Total/Avail)  
 Slots (Total/Avail)<sup>10</sup>

## xSeries 345 At-A-Glance

8670-11X	2 <sup>2</sup>	1/2	512	512MB/8GB	Rack (2U)	1/2	P, H, F	O - Power, O - Fans	Y	2 x 10/100/1000	D, U320	2/0	0/880.8GB	24x-10x	8/6	5/5
8670-31X	2.4 <sup>2</sup>	1/2	512	512MB/8GB	Rack (2U)	1/2	P, H, F	O - Power, O - Fans	Y	2 x 10/100/1000	D, U320	2/0	0/880.8GB	24x-10x	8/6	5/5
8670-51X	2.67 <sup>3</sup>	1/2	512	512MB/8GB	Rack (2U)	1/2	P, H, F	O - Power, O - Fans	Y	2 x 10/100/1000	D, U320	2/0	0/880.8GB	24x-10x	8/6	5/5
8670-61X	2.8 <sup>3</sup>	1/2	512	512MB/8GB	Rack (2U)	1/2	P, H, F	O - Power, O - Fans	Y	2 x 10/100/1000	D, U320	2/0	0/880.8GB	24x-10x	8/6	5/5

- Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. See Rack Cabinets and Options section for supported IBM racks.
- Intel Xeon processor with advanced transfer L2 cache and 400MHz (quad-pumped) access to memory and I/O buses. Not supported in models 51X and 61X.
- Intel Xeon processor with advanced transfer L2 cache and 533MHz (quad-pumped) access to memory and I/O buses. Not supported in models 11X and 31X.
- High-speed, two-way interleaved 133MHz DDR PC2100 RDIMM. Maximum amount includes four 2GB RDIMMs, which requires replacing the standard RDIMMs. When either two or four 2GB RDIMMs are installed, thermal limitations require redundant cooling provided by installing 350w Hot-swap Redundant Power Supply (P/N 59P4057).
- Power supply redundancy requires installation of optional 350w Hot-swap Redundant Power Supply (P/N 59P4057), which includes a power supply, line cord and three hot-swap fans that provide redundant cooling.
- The dual-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not installed. One additional HDD may be designated as a hot-spare for HDDs configured in the onboard mirror. Mirrored and hot-spare HDDs must be matched.
- xSeries 345 includes two slim-line media bays populated by a standard slim-line CD-ROM and a floppy disk drive.
- Total capacity includes installation of six 146.8GB slim-line (SL) hot-swap HDDs.
- Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
- Three slots are horizontal full-size slots (two full-length and one half-length) and two are vertical low-profile slots that are both full-length (see I/O Options section).

## xSeries 345 Processors

Part Number	Processor Upgrades	SMP Support <sup>1</sup>	Processor Speed Upgrade <sup>2</sup>
33P2931	2GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	11X	-
37L3533	2.4GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	31X	11X
71P8966	Upgrade Xeon Processor 2.67GHz/533MHz-512KB L2 Cache	51X	-
71P8967	Upgrade Xeon Processor 2.8BGHz/533MHz-512KB L2 Cache	61X	51X

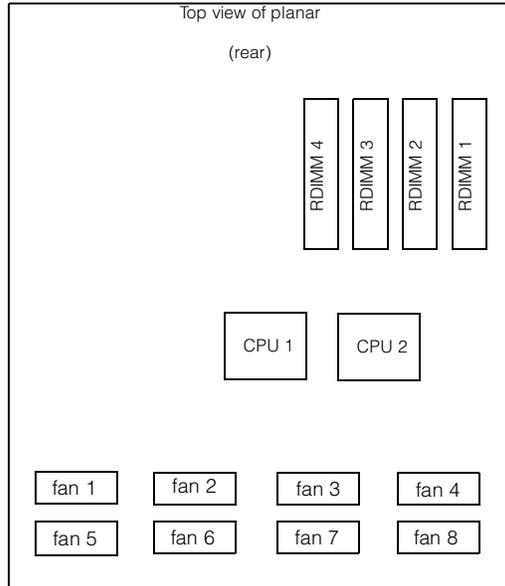
- One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
- Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access [www.pc.ibm.com/support](http://www.pc.ibm.com/support) and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS."

**xSeries 345 Memory**

Part Number	Memory Description <sup>1</sup>
33L5037	256MB DDR PC2100 ECC RDIMM
33L5038	512MB DDR PC2100 ECC RDIMM
33L5039	1GB DDR PC2100 ECC RDIMM
33L5040	2GB DDR PC2100 ECC RDIMM <sup>2</sup>

1. Due to two-way interleaving, installation of memory options in matched pairs is required. Install first two RDIMMs in sockets one and two and the second set in sockets three and four (refer to planar diagram).

2. Due to thermal requirements associated with optional 2GB DDR PC2100 ECC RDIMM, 350w Hot-swap Power Supply Upgrade (P/N 59P4057) must be installed to support either one or two pairs of this RDIMM. The power supply upgrade includes a hot-swap power supply providing N+N power redundancy and three additional fans that provide redundant cooling.



Total System Memory <sup>1</sup>	Quantity of RDIMMs Added				
	512MB (2 x 256MB)	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)	2GB (33L5040)
1GB	2	-	-	-	-
1.5GB	-	2	-	-	-
2.5GB	-	-	2	-	-
3GB <sup>2</sup>	-	2	2	-	-
4GB <sup>2</sup>	-	-	4	-	-
5GB <sup>2</sup>	-	2	-	2	-
6GB <sup>2</sup>	-	-	2	2	2
8GB <sup>2</sup>	-	-	-	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires replacing the standard RDIMMs.

**xSeries 345 Internal SCSI Cabling**

The xSeries 345 includes eight front-accessible bays. The top right slim-line bay contains a slim-line 3.5in diskette drive and the top left slim-line bay contains a slim-line CD-ROM. Six slim-line, hot-swap HDD bays are located in the center of the front of the chassis.

The system contains a DASD backplane supporting six hot-swap, SCA-2-compliant HDD bays. The backplane is connected to one of the connectors of the integrated Ultra320 SCSI controller through a 16-bit (nonterminated) LVD SCSI cable. In RAID configurations using ServeRAID-5i, no cable is required and both channels of the integrated controller are managed by ServeRAID-5i. Internal RAID configurations using ServeRAID-4Mx or -4Lx require optional 30in nonterminated Single-drop Internal LVD Ultra160 SCSI Cable (P/N 71P8995).

External SCSI device attachment is facilitated by a dedicated 0.8mm VHDCI port on the rear of the system chassis, which is connected to the second channel of the integrated controller. If ServeRAID-5i is installed, supported tape drives that can be installed in an external tape enclosure are limited (see Tape Options section). External tape enclosures are also supported by installing PCI Wide Ultra160 SCSI Adapter (P/N 19K4646).

The 24x-10x CD-ROM is connected to the IDE port through an interposer card.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**



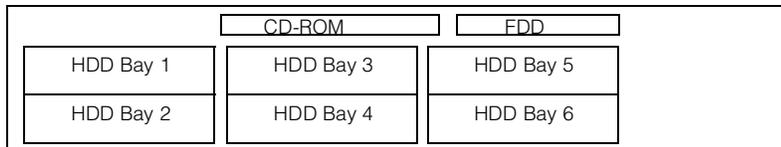
**xSeries 345 Hard Disk Drive (HDD) Storage**

Total Internal Storage <sup>1</sup>	10,000rpm HDDs				15,000rpm HDDs		
	18.2GB (06P5754)	36.4GB (06P5755, 32P0726) <sup>2</sup>	73.4GB (06P5756, 32P0727) <sup>2</sup>	146.8GB (32P0728) <sup>2</sup>	18.2GB (06P5767)	36.4GB (32P0734, 06P5768, 06P5776) <sup>2</sup>	73.4GB (32P0735)
0GB	Standard on base models						
18.2GB	1	-	-	-	1	-	-
36.4GB	2	1	-	-	2	1	-
54.6GB	3	-	-	-	3	-	-
72.8GB	4	2	-	-	4	2	-
91GB	5	-	-	-	5	-	-
109.2GB	6	3	-	-	6	3	-
145.6GB	-	4	-	-	-	4	-
182GB	-	5	-	-	-	5	-
218.4GB	-	6	-	-	-	6	-
220.2GB	-	-	3	-	-	-	3
293.6GB	-	-	4	2	-	-	4
367GB	-	-	5	-	-	-	5
440.4GB	-	-	6	3	-	-	6
587.2GB	-	-	-	4	-	-	-
734GB	-	-	-	5	-	-	-
880.8GB	-	-	-	6	-	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. When an Ultra320 HDD is installed in the same SCSI bus as an Ultra160 HDD, performance of the entire bus is reduced to Ultra160 speeds.

Bay	Form Factor	Height	Front Access	Usage
A	133mm (5.25in)	SL	Yes	CD-ROM
B	89mm (3.5in)	SL	Yes	FDD
1 ... 6	89mm (3.5in)	SL	Yes	Open

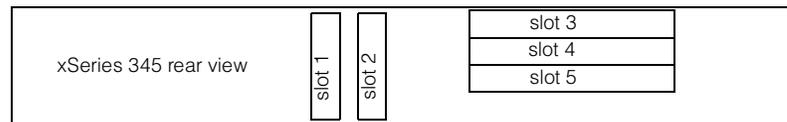


xSeries 345 front view

Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
<b>Hot-swap Ultra160 HDDs<sup>1</sup></b>					
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1 ... 6	6
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	6
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	6
<b>Hot-swap Ultra320 HDDs<sup>1</sup></b>					
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 6	6
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 6	6
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1 ... 6	6
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	15000	SL	1 ... 6	6
32P0734	36.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1 ... 6	6
32P0735	73.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1 ... 6	6
<b>External Storage Expansion Units<sup>2</sup></b>		<b>Form Factor</b>			
35311RU	EXP300 Storage Expansion Unit <sup>3</sup>	Rack (3U)			
17401RU	FAST EXP700 Storage Expansion Unit <sup>4</sup>	Rack (3U)			
35601RU	FAS5T EXP500 Storage Expansion Unit <sup>4</sup>	Rack (3U)			
35421RU	FAST200 Storage Server <sup>6, 7</sup>	Rack (3U)			
35422RU	FAST200 HA Storage Server <sup>6</sup>	Rack (3U)			
19K1121	FAST200 Redundant RAID Controller	-			

1. Mixing of Ultra160 and Ultra320 HDDs is supported, but the entire bus will operate at the speed of the slowest HDD.
2. To configure a SCSI storage device, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.
3. EXP300 includes a single 2m Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord.
4. FAST EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.
5. FAS5T EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350w power supplies, each with its own power cord.
6. The FAST200 includes two hot-swap, 350w auto-ranging redundant power supplies, each with its own power cord.
7. Can be upgraded to FAST200 HA Storage Server through the addition of a FAST200 Redundant RAID Controller (P/N 19K1121).

### xSeries 345 I/O Options



- Slot 1: Bus A, 64-bit, 100MHz, 3.3v, PCI-X, low-profile, full-length
- Slot 2: Bus A, 64-bit, 100MHz, 3.3v, PCI-X, low-profile, full-length extended (supports ServeRAID-5i)
- Slot 3: Bus B, 64-bit, 133MHz, 3.3v, PCI-X, full-length, installs horizontally on riser card
- Slot 4: Bus B, 64-bit, 133MHz, 3.3v, PCI-X, full-length, installs horizontally on riser card
- Slot 5: Bus C, 32-bit, 33MHz, 5v, half-length, installs horizontally on riser card



Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>1, 17</sup>	Hot-Plug <sup>2</sup>	PCI Voltage	MHz
<b>Storage Controllers<sup>3</sup></b>							
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	3, 4	-	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>5</sup>	Half	64-bit	3, 4	-	Universal	66
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>6</sup>	Half	32-bit	1 ... 4	-	Universal	33
25P3492	ServeRAID-5i Controller <sup>7</sup>	Full	64-bit	2	-	Universal	66
<b>Internal RAID Cable</b>							
71P8995	Single-drop Internal LVD Ultra160 SCSI Cable	-	-	-	-	-	-
<b>Fibre Storage Controllers and Options<sup>8</sup></b>							
00N6881	FAST Host Adapter	Half	64-bit	3, 4	-	Universal	66
24P0960	FC2-133 Host Bus Adapter <sup>9</sup>	Half	64-bit	1 ... 4	-	Universal	133
174290U	FAST900 Storage Server (US line cord)	-	-	-	-	-	-
17421RU	FAST700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FAST500 Storage Server	-	-	-	-	-	-
35421RU	FAST200 Storage Server	-	-	-	-	-	-
35422RU	FAST200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>10</sup>	-	-	-	-	-	-
<b>Networking<sup>11</sup></b>							
<b>Ethernet<sup>12</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>13</sup>	Half	32-bit	3, 4	-	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>13</sup>	Half	64-bit	3, 4	-	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>13</sup>	Half	64-bit	3, 4	-	Universal	133
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter <sup>9</sup>	Half	64-bit	1 ... 4	-	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>9, 13</sup>	Half	64-bit	1 ... 4	-	Universal	133
<b>Token Ring</b>							
34L5201	High-speed 100/16/4 Token-ring PCI Management Adapter	Half	32-bit	3, 4	-	Universal	33
34L5001	16/4 Token-ring PCI Management Adapter <sup>13</sup>	Half	32-bit	3, 4	-	Universal	33
07P2701	16/4 Token-ring Low Profile PCI Management Adapter <sup>13</sup>	Half	32-bit	1, 2	-	Universal	33
<b>Communications<sup>14</sup></b>							
19K4162	V90 PCI Data/Fax WinModem (Low Profile Enabled) <sup>15</sup>	Half	32-bit	3, 4	-	Universal	33
33L4618	V90 PCI Data/Fax Modem <sup>15</sup>	Half	32-bit	5	-	5	33
<b>System Management</b>							
09N7585	Remote Supervisor Adapter <sup>16</sup>	Half	32-bit	5	-	Universal	33

1. A 64-bit adapter installed into a 32-bit slot will transfer data at 32-bit rates. Adapters rated at 66MHz will operate at 33MHz when installed in a 33MHz slot. 33MHz adapters will reduce 66MHz buses to 33MHz. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.

2. This system does not support hot-plug PCI.

3. xSeries 345 includes a dual-channel Ultra320 SCSI controller. Channel A is connected to the hot-swap backplane and channel B to an external 0.8mm VHDCI connector. If ServeRAID-5i is installed in slot two, both channels of the integrated controller are managed by the RAID controller and support of external SCSI devices using the 0.8mm VHDCI external connector are subject to RAID rules.

4. ServeRAID-4Mx Ultra 160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connectors. External connectors are 0.8mm VHDCI. Internal connection to the HDD backplane requires optional Single-drop Internal LVD Ultra 160 SCSI Cable (P/N 71P8995) which is a 30in single-drop round nonterminated LVD SCSI cable.

5. ServeRAID-4Lx Ultra 160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI. Internal connection to the HDD backplane requires optional Single-drop Internal LVD SCSI Cable (P/N 71P8995) which is a 30in single-drop round nonterminated LVD SCSI cable.

6. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized. Hardware is included in the option to support either low-profile or full-size installations.

7. ServeRAID-5i (P/N 25P3492) supports both Ultra320 and Ultra160 HDDs in a dedicated or mixed environment. The adapter installs into PCI slot two and converts both channels of the onboard SCSI controller to RAID in conjunction with the LSI 1020/30 chipset. The standard SCSI HDD backplane cables directly to the onboard controller connectors. Half-high tape drives can be supported either internally or externally on the second channel of an integrated controller managed by ServeRAID-5i if the bus is designated as SCSI during RAID setup. Supports up to 528MB/s data transfers across the PCI bus with 128MB ECC SDRAM write-back cache with battery backup. Supports RAID levels 0, 1, 10, 5, 50 and 1E.

8. See Fibre Channel Solutions Overview section for additional configuration information.

9. The option includes brackets for installation in both low-profile and standard PCI slots.

10. The 2108R3L SAN Data Gateway Router UltraSCSI LVD Port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).

11. xSeries 345 includes dual integrated copper Intel 10/100/1000Mbps Ethernet controllers, which support Wake on LAN.

12. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Three optional adapters are copper and Intel-based (P/N 06P3601, 22P4901, 22P6801). Two adapters are Broadcom-based (P/N 22P7801, 31P6301).

13. The Wake on LAN (WoL) function provided by this Ethernet PCI adapter is supported in this system.

14. xSeries 345 provides three USB ports (two on the rear of the chassis and one on the front), one serial port and two RS-485 ports for system management.

15. Due to homologation variances, modem availability may differ by country.

16. When installed in xSeries345, Remote Supervisor Adapter (RSA) shares functionality with the integrated service processor and serves as interface for both. RSA provides full system management functionality through a customer-supplied Ethernet cable or modem connection or as part of an interconnected system management bus (option includes all interconnect hardware). An external Cat5 connection between RSA and the integrated service processor using the pigtail cable and short Cat5 cable supplied with RSA is not required. The 20-pin ribbon cable connecting RSA to the planar meets all powering and signaling requirements. Connection of the external AC power supply provided with RSA is not required.

17. Models 11X and 31X with 400MHz FSB support most full-size, half-length, universal-keyed PCI adapters also in slot five.



**xSeries 345 Power, Monitors & Accessories**

Part Number	Description
<b>Power<sup>1</sup></b>	
59P4057	350w Hot-swap Power Supply Upgrade <sup>2</sup>
<b>Uninterruptible Power Supply (UPS)<sup>3</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>4</sup>
2130R31	UPS3000XHV <sup>4</sup>
32P1692	UPS Extend Run Battery Pack <sup>4</sup>
37L6861	APC Smart-UPS 5000RMB <sup>5</sup>
<b>Monitors<sup>6</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>7</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>

- xSeries 345 ships with a single worldwide, voltage-sensing 350w hot-swap power supply and two 9ft power cords, one auto-sensing cable with IEC 320-C 13 to IEC 320-C14 connectors for attachment to a rack PDU or high-voltage UPS and the other a low-voltage cord with IEC 320-C 13 to NEMA 5-15P connectors for direct attachment to the local power source depending on country requirements. N+N power supply redundancy requires installation of optional 350w Hot-swap Redundant Power Supply (P/N 59P4057).
- 350w Hot-swap Power Supply Upgrade includes a power supply, three hot-swap fans that provide redundant cooling and one 9ft power cord for connection to a rack PDU. If a low voltage connection is required, use optional low-voltage 14ft NEMA 5-15P power cord (P/N 94G6667).
- For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
- Height is 2U. See Rack Cabinets and Options section for supported IBM racks.
- Height is 5U. See Rack Cabinets and Options section for supported IBM racks.
- xSeries 345 uses an integrated ATI Rage XL video controller with 8MB of memory.
- Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
- Includes a 15in Flat Panel Monitor.

Part Number	Description
<b>Rack and NetBAY<sup>1</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>3</sup></b>	
28L3644	Space Saver II Keyboard <sup>4, 6</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>5, 7</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>4, 6, 7</sup>
31P7415	Preferred Pro Full-size Keyboard - 104 Keys (stealth black) <sup>5, 7</sup>
28L3673	Sleek 2-Button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>7</sup>

- xSeries 345 is housed in a 19in rack-mountable drawer and requires one of the racks listed in the Rack Cabinets and Options section.
- Refer to the Rack Console Options section for information regarding console connectivity using these options.
- xSeries 345 supports rack configurations only and ships without a mouse or keyboard.
- Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).
- Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.
- Advanced TrackPoint IV features are not available on IBM xSeries systems.
- USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.



### xSeries 345 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures
00N7991	20/40GB DDS/4 4mm Internal Tape Drive <sup>1</sup>	-	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	Y <sup>2</sup>	3510020 <sup>4</sup> 3551001 <sup>3</sup> 0034B0X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
24P2396	100/200GB LTO Half-High Tape Drive <sup>1, 10, 11</sup>	-	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup> 3510020 <sup>4</sup> 0034B0X
24P2398	40/80GB Half-High DLT/VS Internal SCSI Tape Drive <sup>1, 11</sup>	-	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup> 3510020 <sup>4</sup> 0034B0X
59P6736	160/320GB SDLT Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3503B1X 0034B0X
<b>Tape Autoloaders</b>						
00N7992	120/240GB DDS/4 Tape Autoloader	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X 0034B0X
360716X	3607 Series 1760GB/3.5TB SDLTpro Tape Autoloader	-	16 Ultra2 LVD	2U Rack	Y	-
<b>External Tape Enclosures</b>						
0034B0X	NetBAY Tape Enclosure (Rack Mount) <sup>9</sup>	-	16 Ultra2 LVD	4U Rack	N	-
3510020	External Half-High SCSI Storage Enclosure <sup>6</sup>	-	16 LVD	Desktop	N	-
3503B1X	Full-High SCSI Tape Enclosure <sup>7</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-
3551001	NetMEDIA Storage Expansion Unit EL <sup>8</sup>	-	16 LVD	Rack	Y	-
<b>External Tape Libraries<sup>9</sup></b>						
4560SLX	SDLT/LTO Modular Tape Library	-	16 Ultra2 LVD	5U Rack	Y	-
<b>Associated Options</b>						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext	Y	3510020

Note: ServeRAID-5i supports the HH tape drives in an external tape enclosure connected to the second channel of the integrated controller through the external 0.8mm VHDCI SCSI connector if the bus is designated to operate as SCSI during RAID set-up and Windows 2000 is installed. Optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) also supports external tape enclosures.

1. Supported by ServeRAID-5i when installed in an external tape enclosure when connected to the second channel of the integrated controller through the external 0.8mm VHDCI SCSI port. The bus must be designated as SCSI during set-up and Microsoft Windows 2000 must be installed.
2. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.
3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.
4. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
5. This 4U rack-mounted enclosure supports four full-high or six half-high tape drives. The backplate includes six 0.8mm VHDCI external connectors for attachment of up to six servers. Internal connection of tape drives requires the single-drop terminated LVD SCSI cable that ships with the tape drive, which also provides termination for the SCSI bus. A single 300w power supply with a low-voltage power cord is standard. An external SCSI storage cable is not provided. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.
7. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016, 00N7992.
8. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.
9. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
10. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.
11. Supported only in new builds of External Half-High SCSI Storage Enclosure (P/N 3510020), indicated by AI Header J1PJK on the outside box label of the tape enclosure.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.



## xSeries 345 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### eCommerce Server

Part Number	Description	Quantity
8670-11X	xSeries 345 2GHz/400MHz-512KB Xeon, 512MB DDR ECC, Ultra320, open, 24X (2U rack)	1
33P2931	2GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	1
33L5039	1GB DDR PC2100 ECC RDIMM	2 <sup>1</sup>
25P3492	ServeRAID-5i Controller	1
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	6 <sup>2</sup>
59P4057	350w Hot-swap Power Supply Upgrade	1
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard)	1
9306250	NetBAY25 Standard Rack Cabinet	1
94G6670	Blank Filler Panel Kit	1
32P1020	APC 2U Smart-UPS 1400RMB	1

1. For a total of 2.5GB of system memory.

2. Six HDDs are used for RAID 5 protection. Effective capacity is five HDDs or 182GB.

### Collaboration/Messaging Server

Part Number	Description	Quantity
8670-31X	xSeries 345 2.4GHz/400MHz-512KB Xeon, 512MB DDR ECC, Ultra320, open, 24X (2U rack)	1
37L3533	2.4GHz/400MHz-512KB L2 Cache Upgrade Option with Xeon Processor	1
33L5037	256MB DDR PC2100 ECC RDIMM	2 <sup>1</sup>
25P3492	ServeRAID-5i Controller	1
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	4 <sup>2</sup>
59P4057	350w Hot-swap Power Supply Upgrade	1
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard)	1
9306250	NetBAY25 Standard Rack Cabinet	1
94G6670	Blank Filler Panel Kit	1
32P1020	APC 2U Smart-UPS 1400RMB	1

1. For a total of 1GB of system memory.

2. Four HDDs are used for RAID 5 protection. Effective capacity is three HDDs or 109.2GB.



# IBM xSeries 360

## EMEA Part Number Cross Reference

xSeries 360 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
K67RXxx	86867RX	8686-7RX	Xeon MP 1.5GHz/400MHz, 1MB, 1GB XA32, Open Bay U160 HS, Rack	---
K68RXxx	86868RX	8686-8RX	2xXeon MP 1.9GHz/400MHz, 1MB, 2GB XA32, Open Bay U160 HS, Rack	---
K69RXxx	86869RX	8686-9RX	2xXeon MP 2.0GHz/400MHz, 2MB, 2GB XA32, Open Bay U160 HS, Rack	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2  
Notes 6&2

xSeries 360 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

Notes 2&F1  
Notes 2&F2  
Notes 2&F3  
Notes 2&F4  
Notes 2&F5

xSeries 360 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION FIBRE STORAGE OPTIONS	EMEA WDFM DATE
71P81xx	174290U	---	FAST900 Storage Server	---
24P09xx	17421RU	---	FAST700 Storage Server	---
00N69xx	35521RU	---	FAST500 Storage Server	---
19K11xx	35421RU	---	FAST200 Storage Server	---
19K11xx	35422RU	---	FAST200 HA Storage Server	---

- Where 'xx' represents a specific country code as follows: 29=Euro/English, 30=Euro/Spanish, 31=Euro/French, 32=Euro/German, 33=Danish/, 34=Israel/English, 35=Italian/English, 36=South Africa/English, 37=Swiss/English, 38=Swiss/French, 39=Swiss/German, 40=UK/English.
- Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.
- Where 'xx' represents a specific country code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

# IBM xSeries 360

## EMEA Part Number Cross Reference

xSeries 360 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION PCI	EMEA WDFM DATE
86841RX	86841RX	---	RXE-100 Remote Expansion Enclosure	---

Note 7

xSeries 360 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
32P15xx	31P6108	---	370W Hot-Swap Redundant Power Supply	---
32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
32P1681	2130R30	---	UPS3000XLV	---
32P16xx	2130R31	---	UPS3000XHV	---
37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

Note 8  
Note 9  
Note 10  
Note 11

7. The xSeries 360 ships with one or two standard country power cords. For connection to a high voltage UPS or PDU, Rack Power Cable P/N 94G7448 needs to be ordered according to requirements.

8. Where 'xx' represents a specific country code as follows:- 74=Europe, 75=Denmark, 76=Israel, 77=Italy, 78=South Africa, 79=Switzerland, 80=UK.

9. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

10. Only available in Saudi Arabia.

11. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

xSeries 360 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

Note 12  
Note 12  
Note 12

12. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

xSeries 360 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
28L36xx	28L3644	---	Spacesaver II Keyboard	---
10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

Note 13  
Note 14  
Note 15

13. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portuguese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

14. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

15. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

xSeries 360 Tape Options				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---
24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---

Note 16

16. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 360

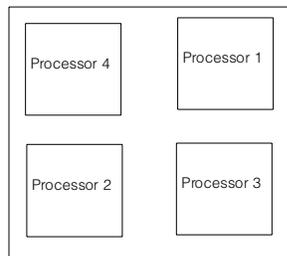
Part Number <sup>1, 2</sup>	Processor Speed (GHz) <sup>3</sup>	Number of Processors (Std/Max)	L3 ECC Cache	Memory (Std/Max) <sup>6</sup>	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard) <sup>7</sup>	Adv System Management Adapter <sup>8</sup>	Onboard Ethernet (Mbps) <sup>8</sup>	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal HDD Storage (Total/Avail)	CD-ROM (IDE) <sup>9</sup>	Bays (Total/Avail)	Slots (Total/Avail) <sup>10</sup>
8686-7RX	1.5 <sup>5</sup>	1/4	1MB	1GB/8GB	Rack (3U)	1/3	P, S, H, F	O - Power, S - Fans	Y	10/100	U160	-	0/220.2GB	24x-10x	5/3	6/6
8686-8RX	1.9 <sup>5</sup>	2/4	1MB	2GB/8GB	Rack (3U)	2/3	P, S, H, F	S - Power, S - Fans	Y	10/100	U160	-	0/220.2GB	24x-10x	5/3	6/6
8686-9RX	2 <sup>5</sup>	2/4	2MB	2GB/8GB	Rack (3U)	2/3	P, S, H, F	S - Power, S - Fans	Y	10/100	U160	-	0/220.2GB	24x-10x	5/3	6/6

- Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. See Rack Cabinets and Options section for supported IBM racks.
- This xSeries 360 model supports the IXA Adapter (P/N 1519100) for connection to iSeries models for Microsoft Windows 2000 Server and Advanced Server. The adapter must be installed in PCI slot three only.
- Intel Xeon MP processor with integrated full-speed ECC L3 cache and 4x100MHz (quad-pumped) access to memory and I/O buses.
- Compatible only with models 4RX, 5RX and 6RX.
- Compatible only with models 7RX, 8RX and 9RX.
- Advanced Chipkill ECC memory corrects two-, three-, and four-bit memory errors.
- N+1 power supply redundancy is provided standard in models with two power supplies and is optional in models with one power supply. One optional 370w Hot-swap Redundant Power Supply (P/N 31P6108) is available for maximum configurations in models shipping with two power supplies or up to two optional power supplies can be added to models shipping with a single power supply. See "Power" under xSeries 360 Power Monitor & Accessories for additional information.
- Advanced system management is provided by a standard Remote Supervisor Adapter installed in a dedicated PCI slot, which allows six optional PCI adapters to be installed.
- Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
- Support for an additional 12 64-bit slots available through installation of the optional RXE-100 Remote Expansion Unit (one unit only supported by xSeries 360).

## xSeries 360 Processors

Part Number	Processor Upgrades	SMP Support <sup>1</sup>	Processor Speed Upgrade <sup>2</sup>
19K4638	xSeries 1.4GHz/400MHz-512KB L3 Cache Upgrade with Xeon Processor MP	4RX	-
19K4639	xSeries 1.5GHz/400MHz-512KB L3 Cache Upgrade with Xeon Processor MP	5RX	4RX
19K4647	xSeries 1.6GHz/400MHz-1MB L3 Cache Upgrade with Xeon Processor MP	6RX	5RX
59P6815	1.5GHz/400MHz-1MB L3 Cache Xeon Processor MP	7RX	-
59P6816	1.9GHz/400MHz-1MB L3 Cache Xeon Processor MP	8RX	7RX
59P6817	2GHz/400MHz-2MB L3 Cache Xeon Processor MP	9RX	7RX, 8RX

- A maximum of four processors can be installed. All processors must be identical in type, speed and cache size. Install processors in the order indicated in the diagram below.
- Requires removal of the standard processor. A maximum of four processors can be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access [www.pc.ibm.com/support](http://www.pc.ibm.com/support) and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS."

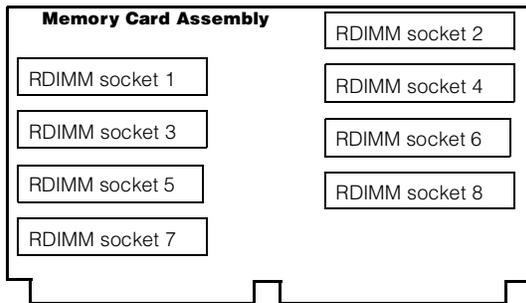




### xSeries 360 Memory

Part Number	Memory Description <sup>1</sup>
33L3281	256MB PC 1600 ECC DDR SDRAM RDIMM
33L3283	512MB PC1600 ECC DDR SDRAM RDIMM
33L3285	1GB PC1600 ECC DDR SDRAM RDIMM

1. Due to two-way interleaving, all RDIMMs must be installed in pairs in the order indicated by the diagram. Chipkill support is provided on the memory card. Only installation in pairs is supported. The order of installation in pairs is sockets one and two, three and four, five and six, and seven and eight.



Total Memory <sup>1</sup>		Quantity of RDIMMs Added <sup>2</sup>		
1GB (2x512MB model)	2GB (4x512MB models)	256MB (33L3281)	512MB (33L3283)	1GB (33L3285)
2GB	3GB	4	-	-
2.5GB	3.5GB	2	2	-
3GB	4GB	-	4	-
3.5GB	4.5GB	2	-	2
4GB	5GB	-	2	2
5GB	6GB	-	-	4
6GB	-	-	2	4
7GB	-	-	-	6
8GB (max) <sup>3</sup>	8GB <sup>3</sup>	-	-	8

This table does not represent all possible memory configurations.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.

2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row.

3. Requires removal of standard RDIMMs.

IBM xSeries 360

### xSeries 360 Internal SCSI Cabling

xSeries 360 contains five front-accessible drive bays located on the right side of the server. The top two bays contain the standard slim-line CD-ROM and 1.44MB slim-line diskette drive. Three 3.5in slim-line, hot-swap drive bays are located beneath them. The IDE CD-ROM is docked to a media interposer card that is cabled to the lightpath card before terminating at the system planar. The three SCA2-compliant hot-swap bays attach to a hot-swap backplane that connects to the integrated single-channel Ultra160 controller through an integrated bus. For RAID configurations, a cable provided with the system is connected to one of the internal connectors of the RAID controller and the other end of the cable is attached to a connector that supports the hot-swap HDD backplane, located on the planar between slot one and the memory card, beneath the memory options.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**

### xSeries 360 Hard Disk Drive (HDD) Storage

Total Int Storage <sup>1</sup>	10,000rpm HDDs			15,000rpm HDDs	
	18.2GB (06P5754)	36.4GB (06P5755)	73.4GB (06P5756)	18.2GB (06P5767)	36.4GB (06P5768)
0GB	Standard in base models				
18.2GB	1	-	-	1	-
36.4GB	2	1	-	2	1
54.6GB	3	-	-	3	-
72.8GB <sup>2</sup>	-	2 <sup>2</sup>	-	-	2
109.2GB	-	3	-	-	3
146.8GB	-	-	2	-	-
220.2GB	-	-	3	-	-

This table does not represent all possible HDD configurations.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.

2. Models 2RX and 3RX include two standard 36.4GB 10,000rpm HDDs installed in bays four and five.



Bay	Form Factor	Height	Front Access	Usage
1	89mm (3.5in)	SL	Yes	Diskette
2	133mm (5.25in)	SL	Yes	IDE CD-ROM
3 ... 5	HS	SL	Yes	Open <sup>1</sup>

1. Two 36.4GB 10,000rpm hot-swap HDDs are standard in models 2RX and 3RX. Model 1RX ships open bay. HDDs are installed in open bay models beginning with the bottom bay (5-4-3).



Part Number	Description	RPM	Height	Bays Supported <sup>1</sup>	Maximum Quantity
<b>Hot-swap Ultra160 SCSI HDDs</b>					
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	3 ... 5	3
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	3 ... 5	3
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	3 ... 5	3
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	3 ... 5	3
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	3 ... 5	3
<b>External Storage Expansion Units<sup>1</sup></b>		<b>Form Factor</b>			
35311RU	EXP300 Storage Expansion Unit <sup>2</sup>	Rack (3U)			
17401RU	FASiT EXP700 Storage Expansion Unit <sup>3</sup>	Rack (3U)			
35601RU	FASiT EXP500 Storage Expansion Unit <sup>4</sup>	Rack (3U)			
35421RU	FASiT200 Storage Server <sup>5, 6</sup>	Rack (3U)			
35422RU	FASiT200 HA Storage Server <sup>5</sup>	Rack (3U)			
19K1121	FASiT200 Redundant RAID Controller	-			

1. To configure an external SCSI storage device, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.

2. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.

3. FASiT EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.

4. FASiT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350W power supplies, each with its own power cord.

5. The FASiT200 includes two hot-swap, 350W auto-ranging redundant power supplies, each with its own power cord.

6. Can be upgraded to FASiT200 HA Storage Server through the addition of a FASiT200 Redundant RAID Controller (P/N 19K1121).



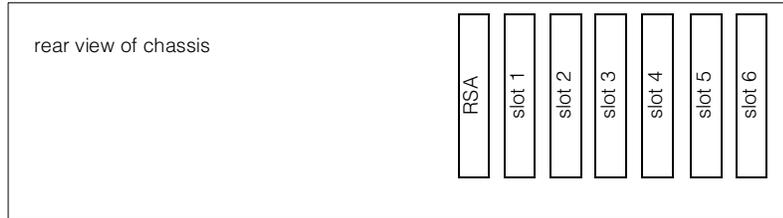
### xSeries 360 I/O Options

Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>1</sup>	Hot-Plug <sup>2</sup>	PCI Voltage Key	MHz <sup>3</sup>
<b>Storage Controllers<sup>4</sup></b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	1 ... 6 <sup>17</sup>	X	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	1 ... 6 <sup>17</sup>	X	Universal	66
06P5740	ServeRAID-4Lx Ultra 160 SCSI Controller <sup>6</sup>	Half	64-bit	1 ... 6	X	Universal	66
19K4646	PCI Wide Ultra 160 SCSI Adapter <sup>8</sup>	Half	32-bit	1 ... 6	-	Universal	66
<b>Fibre Storage Controllers and Options<sup>9</sup></b>							
00N6881	FASt Host Adapter	Half	64-bit	1 ... 6	X	Universal	66
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	1 ... 6	X	Universal	133
174290U	FASt900 Storage Server (US line cord)	-	-	-	-	-	-
17421RU	FASt700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FASt500 Storage Server	-	-	-	-	-	-
35421RU	FASt200 Storage Server	-	-	-	-	-	-
35422RU	FASt200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port (2Gb)	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>10</sup>	-	-	-	-	-	-
<b>Networking<sup>11</sup></b>							
<b>Ethernet<sup>12</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>13</sup>	Half	32-bit	1 ... 6	X	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>13</sup>	Half	64-bit	1 ... 6	X	Universal	66
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter <sup>18</sup>	Half	64-bit	1 ... 6	-	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>13</sup>	Half	64-bit	1 ... 6	-	Universal	133
<b>Token Ring</b>							
34L5001	16/4 Token-Ring PCI Management Adapter <sup>13</sup>	Half	32-bit	1 ... 6	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter <sup>13</sup>	Half	32-bit	1 ... 6	X	Universal	33
<b>System Management<sup>14</sup></b>							
03K9309	Advanced System Management Interconnect Cable Kit <sup>15</sup>	-	-	-	-	-	-
<b>Remote I/O Expansion</b>							
8684-1RX	RXE-100 Remote Expansion Enclosure <sup>16</sup>	-	-	-	-	-	-

Note: xSeries 360 supports the IXA Adapter (P/N 1519100) for connection to iSeries models. This adapter is supported in slot three only.

1. Adapters rated at a lower frequency than the slots in which they are installed will reduce the bus to the frequency of the slowest adapter. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.
2. All six slots are full-length hot-plug capable. For Network Operating System support, access [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat).
3. Bus two (slots one and two) supports 133MHz operation of a single 133MHz adapter installed in slot one with slot two remaining empty. If 133MHz adapters are installed in both slots one and two, the bus speed for both slots becomes 100MHz.
4. xSeries 360 includes an integrated single-channel Ultra160 SCSI controller. See "Internal SCSI Cabling" for cabling alternatives. When a RAID controller is installed as a boot disk, it must be installed in a slot that is scanned before other RAID controllers in a configuration. Refer to the scan sequence provided in this section.
5. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache. The two internal connectors are not accessible due to a cabling interference. Four external Ultra160 0.8mm VHDCI connectors are available.
6. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connectors are 0.8mm VHDCI.
7. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. This system supports external connection only.
9. See Fibre Channel Solutions Overview section for additional configuration information.
10. The 2108R3L SAN Data Gateway Router Ultra SCSI LVD port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).
11. xSeries 360 has an integrated copper Intel-based 10/100 PCI Ethernet controller. Wake on LAN is supported only for the integrated controller.
12. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Two of the optional PCI Ethernet adapters listed are copper and Intel-based (P/N 06P3601, 22P4901). Two adapters are Broadcom-based (P/N 22P7801, 31P6301).
13. The Wake on LAN function of this option is not supported by this server.
14. xSeries 360 includes a Remote Supervisor Adapter installed in a dedicated PCI slot with an external connector, leaving six PCI slots available for optional adapters. Support for connection to other servers requires an optional Advanced System Management Interconnect Cable Kit (P/N 03K9309). Direct connection to the RXE drawer management controller in an RXE-100 Remote Expansion Enclosure is supported through a standard Interconnect Management Cable Kit with 3.5m cable connecting to an integrated RS-485 port on the rear of the system chassis. An 8m optional cable is available.
15. Required to connect the standard Remote Supervisor Adapter to an interconnect network with other servers for system management support through a single LAN or modem connection. Up to 24 Integrated System Management Processors or Remote Supervisor Adapters may be interconnected with an aggregate connection length of no more than 91.4m (300ft). This interconnect network of 24 devices may include a maximum of 12 Advanced System Management Processors or Advanced System Management PCI Adapters. A customer-supplied Cat5 cable is required for each interconnection.
16. RXE-100 Remote Expansion Enclosure supports up to 12 additional PCI-X slots. Cable required for connection included with expansion unit, which attaches to a standard external connector located on the back of the x360 chassis. An optional longer cable is available. See section on RXE-100.
17. Not supported in slot one if the RAID adapter is attached to the connector on the planar that controls the hot-swap backplane as a result of a cabling interference with the standard RAID cable, which must be routed under the adapter. External RAID attachment only is supported for full-length RAID adapters installed in slot one.
18. The hot-plug feature of this adapter is not supported on this system.

IBM xSeries 360



RSA: standard Remote Supervisor Adapter  
 Slot 1: Bus 2, 100MHz, 64-bit, full-length, Active PCI-X, 3.3v (Bus 2 also supports one 133MHz adapter installed in slot 1.)  
 Slot 2: Bus 2, 100MHz, 64-bit, full-length, Active PCI-X, 3.3v (Slot 2 must be empty to support 133MHz bus 2 frequency.)  
 Slot 3: Bus 1, 66MHz, 64-bit, full-length, Active PCI-X, 3.3v  
 Slot 4: Bus 1, 66MHz, 64-bit, full-length, Active PCI-X, 3.3v  
 Slot 5: Bus 1, 66MHz, 64-bit, full-length, Active PCI-X, 3.3v  
 Slot 6: Bus 1, 66MHz, 64-bit, full-length, Active PCI-X, 3.3v

Scan sequence:  
 Inside the server: slots 3, 4, 5, 6, 1, 2  
 Continuing in an RXE-100: slots 11, 12, 9, 10, 7, 8, 17, 18, 15, 16, 13, 14.

**xSeries 360 Power, Monitors & Accessories**

Part Number	Description
<b>Power<sup>1</sup></b>	
31P6108	370W Hot-Swap Redundant Power Supply <sup>2</sup>
<b>Uninterruptible Power Supply (UPS)<sup>3, 4</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>5</sup>
2130R31	UPS3000XHV <sup>5</sup>
32P1692	UPS Extend Run Battery Pack <sup>5</sup>
37L6861	APC Smart-UPS 5000RMB <sup>6</sup>
<b>Monitors<sup>7</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>8</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>8</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>8</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>9</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>9</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>9</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>9</sup>

1. xSeries 360 models 8RX and 9RX include two 370w, hot-swap power supplies, each with two 9ft power cords--one high voltage IEC 320-C13 to IEC 320-C14 and one low voltage IEC 320-C13 to NEMA 5-15P. N+1 power supply redundancy is standard for these models. The addition of an optional 370w Hot-Swap Redundant Power Supply (P/N 31P6108) is supported for configurations of greater than 370w with power redundancy, i.e., a total of three 370w power supplies. Model 7RX includes one standard power supply and may be upgraded to two or three power supplies according to the same rules for redundancy as models 8RX and 9RX.  
 2. 370w Hot-Swap Redundant Power Supply (P/N 31P6108) includes two 9ft power cords, one high voltage IEC 320-C13 to IEC 320-C14 and one low voltage IEC 320-C13 to NEMA 5-15P.  
 3. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.  
 4. Because the x360 is not equipped with a serial port, UPS remote management requires a USB to serial adapter such as the Belkin USB to Serial Adapter (P/N 10K3661), which is available at [www.pc.ibm.com/ww/eserver/xseries](http://www.pc.ibm.com/ww/eserver/xseries). Select Accessories, Upgrades & Monitors and the country, then click Go. Scroll to the bottom of the page, select Cables and Adapters, then open the Adapters pulldown menu.  
 5. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.  
 6. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.  
 7. xSeries 360 uses an SVGA controller (S3 Savage4 LT chipset) with 8MB of video memory. Optional video adapters are not supported.  
 8. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).  
 9. Includes a 15in Flat Panel Monitor.



The following table is provided as a reference. The table shows an example of a maximum configuration that can be supported by two 370W power supplies with power redundancy.

Number of power supplies	System configuration supported
2	<b>Redundant</b>
	Up to three processors
	Up to four PCI adapters
	Up to two HDDs
	Up to six memory RDIMMs

Part Number	Description
<b>Rack and NetBAY<sup>1</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>3</sup></b>	
28L3644	Space Saver II Keyboard <sup>4, 5</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>4, 5, 7</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>6, 7</sup>
28L3673	Sleek 2-Button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>7</sup>

1. xSeries 360 is housed in a 19in rack-mountable drawer and requires one of the racks listed in the Rack Cabinets and Options section.

2. Refer to the Rack Console Options section for information regarding console connectivity using these options.

3. xSeries 360 supports rack configurations only and ships without a keyboard or mouse. The system includes three USB ports, SVGA video port, mouse port and keyboard port.

4. Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).

5. Advanced TrackPoint IV features are not available on IBM xSeries systems.

6. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.

7. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches.

IBM xSeries 360



### xSeries 360 Tape Options

Part Number	Tape Drives	Bays Supported <sup>1</sup>	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
24P2396	100/200GB LTO Half-High Tape Drive <sup>7</sup>	-	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup>
59P6736	160/320GB SDLT Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>1</sup>	3503B1X
<b>External Tape Enclosures</b>						
3551001	NetMEDIA Storage Expansion Unit EL <sup>4</sup>	-	16 LVD	Rack	Y	-
3503B1X	Full-High SCSI Tape Enclosure <sup>5</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-
<b>External Tape Libraries<sup>6</sup></b>						
4560SLX	SDLT/LTO Modular Tape Library	-	16 Ultra2 LVD	5U Rack	Y	-

1. IBM xSeries 360 does not support internal tape drives. An external tape library or tape enclosure must be used. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8mm VHDCI connector. Select tape drive, enclosure and controller then use Appendix D: Cables - Storage Units - Controllers to select an appropriate external cable.

2. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.

3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.

4. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.

5. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016.

6. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.

7. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.



## xSeries 360 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### Microsoft Exchange SCSI Solution<sup>1</sup>

Part Number	Description	Quantity
8686-8RX	xSeries 360 2x1.9GHz/400MHz-1MB L3 Cache Xeon MP, 2GB ECC, open, 24x (3U rack)	1
59P6816	1.9GHz/400MHz-1MB L3 Cache Xeon Processor MP	2 <sup>2</sup>
31P6108	xSeries 370W Hot-swap Redundant Power Supply	1 <sup>3</sup>
33L3283	512MB PC 1600 ECC DDR SDRAM RDIMM	2 <sup>4</sup>
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1 <sup>5</sup>
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	3 <sup>6</sup>
06P3601	10/100 Ethernet Server Adapter	1
19K4646	PCI Wide Ultra160 SCSI Adapter	1
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black	1
37L6861	APC Smart-UPS 5000RMB	1
<b>External Storage</b>		
35311RU	EXP300 Storage Expansion Unit	2
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	14 <sup>7</sup>
3551001	NetMEDIA Storage Expansion Unit EL	1
00N8016	100/200GB LTO Tape Drive	1
<b>Rack Options</b>		
9306250	NetBAY25 Standard Rack Cabinet	1
28L3644	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	1

1. This configuration supports 8000 users.
2. Total of four processors.
3. Required to maintain N+1 power redundancy in this configuration--total of three 370W power supplies.
4. Total memory of 3GB.
5. External connectors only can be used due to an internal cabling restriction.
6. Total internal storage of 109.2GB.
7. Six HDDs are used for RAID-5E protection in each EXP300. One HDD is identified as a hot-spare. Effective capacity is five HDDs in each storage enclosure (total of 182GB).

### Microsoft Exchange High-Availability Fibre Channel Solution<sup>1</sup>

Part Number	Description	Quantity
8686-9RX	xSeries 360 2x2GHz/400MHz-2MB, L3 Cache Xeon MP, 2GB ECC, open, 24x (3U rack)	1
59P6817	2GHz/400MHz-2MB L3 Cache Xeon Processor MP	2 <sup>2</sup>
31P6108	xSeries 370W Hot-swap Redundant Power Supply	1 <sup>3</sup>
33L3283	512MB PC 1600 ECC DDR SDRAM RDIMM	2 <sup>4</sup>
06P5736	ServeRAID-4MX Ultra160 SCSI Controller	1
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	3 <sup>5</sup>
06P3601	10/100 Ethernet Server Adapter	1
24P0960	FC2-133 Host Bus Adapter	2
8684-1RX	RXE-100 Remote Expansion Enclosure	1
37L6861	APC Smart-UPS 5000RMB	1
2130R30	UPS3000XLV	1
<b>External Storage</b>		
17421RU	FASiT 700 Storage Server	1 <sup>6</sup>
35601RU	FASiT EXP500 Storage Expansion Unit	3
19K0653	Netfinity 36.4GB 10K-4 FC Hot-Swap HDD	18 <sup>7</sup>
<b>Rack Options</b>		
9306420	NetBAY42 Standard Rack Cabinet	1
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (w/ US Space Saver Keyboard)	1
94G6670	Blank Filler Panel Kit	1

1. This configuration supports 8000 users.
2. Total of four processors.
3. Required to maintain N+1 power redundancy in this configuration--total of three 370W power supplies.
4. Total memory of 3GB.
5. Total internal storage of 109.2GB.
6. Fibre Channel cable, SFP Modules and FASiT700 Mini Hubs not included.
7. Six HDDs are used for RAID-5E protection in each FASiT EXP500. One HDD is identified as a hot-spare. Effective capacity is five HDDs in each storage enclosure (total of 182GB).



# IBM xSeries 440

## EMEA Part Number Cross Reference

xSeries 440 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
K71RXxx	86871RX	8687-1RX	2xXeon MP 1.4GHz/400MHz, 512KB, 2GB, Open Bay U160 HS, Rack	---
K72RXxx	86872RX	8687-2RX	2xXeon MP 1.5GHz/400MHz, 512KB, 2GB, Open Bay U160 HS, Rack	---
K73RXxx	86873RX	8687-3RX	2xXeon MP 1.6GHz/400MHz, 1MB, 2GB, Open Bay U160 HS, Rack	---
K74RXxx	86874RX	8687-4RX	2xXeon MP 1.5GHz/400MHz, 1MB, 2GB, Open Bay U160 HS, Rack	---
K75RXxx	86875RX	8687-5RX	2xXeon MP 1.9GHz/400MHz, 1MB, 2GB, Open Bay U160 HS, Rack	---
K76RXxx	86876RX	8687-6RX	4xXeon MP 1.9GHz/400MHz, 1MB, 4GB, Open Bay U160 HS, Rack	---
K77RXxx	86877RX	8687-7RX	4xXeon MP 2.0GHz/400MHz, 2MB, 2GB, Open Bay U160 HS, Rack	---
K73RYxx	86873RY	8687-3RY	2xXeon DP 2.4GHz/400MHz, 512KB, 2GB, Open Bay U160 HS, Rack	---
K74RYxx	86874RY	8687-4RY	4xXeon DP 2.4GHz/400MHz, 512KB, 4GB, Open Bay U160 HS, Rack	---
K71VXxx	86871VX	8687-1VX	8xXeon MP 1.4GHz/400MHz, 512KB, 4GB, Open Bay U160 HS, Rack	---
K72VXxx	86872VX	8687-2VX	8xXeon MP 1.5GHz/400MHz, 512KB, 4GB, Open Bay U160 HS, Rack	---
K73VXxx	86873VX	8687-3VX	8xXeon MP 1.6GHz/400MHz, 1MB, 4GB, Open Bay U160 HS, Rack	---
K74VXxx	86874VX	8687-4VX	8xXeon MP 1.5GHz/400MHz, 1MB, 4GB, Open Bay U160 HS, Rack	---
K75VXxx	86875VX	8687-5VX	8xXeon MP 1.9GHz/400MHz, 1MB, 4GB, Open Bay U160 HS, Rack	---
K76VXxx	86876VX	8687-6VX	8xXeon MP 2.0GHz/400MHz, 2MB, 4GB, Open Bay U160 HS, Rack	---

xSeries 440 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2  
Notes 6&2

1. Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.

2. This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.

3. Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.

4. Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.

5. Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..

6. Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 360 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION FIBRE STORAGE OPTIONS	EMEA WDFM DATE
71P81xx	174290U	---	FAST900 Storage Server	---
24P09xx	17421RU	---	FAST700 Storage Server	---
00N69xx	35521RU	---	FAST500 Storage Server	---
19K11xx	35421RU	---	FAST200 Storage Server	---
19K11xx	35422RU	---	FAST200 HA Storage Server	---

Notes 2&F1  
Notes 2&F2  
Notes 2&F3  
Notes 2&F4  
Notes 2&F5

F1. Where 'xx' represents a specific country code as follows: 29=Euro/English, 30=Euro/Spanish, 31=Euro/French, 32=Euro/German, 33=Danish/, 34=Israel/English, 35=Italian/English, 36=South Africa/English, 37=Swiss/English, 38=Swiss/French, 39=Swiss/German, 40=UK/English.

# IBM xSeries 440

## EMEA Part Number Cross Reference

F2. Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.

F3. Where 'xx' represents a specific country code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English.

F4. Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..

F5. Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

xSeries 440 I/O Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
86841RX	86841RX	---	RXE-100 Remote Expansion Enclosure	---

Note 7

xSeries 440 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
32P1681	2130R30	---	UPS3000XLV	---
32P16xx	2130R31	---	UPS3000XHV	---
37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

Note 8  
Note 9  
Note 10

7. The xSeries 440 ships with two standard country power cords and two Rack Power cords for connection either to wall sockets or a high voltage UPS or PDU.

8. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

9. Only available in Saudi Arabia.

10. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

Note 11  
Note 11

xSeries 440 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION MONITORS	EMEA WDFM DATE
T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
T274Axx	66274AN	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A

11. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

Note 12  
Note 13  
Note 14

xSeries 440 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
28L36xx	28L3644	---	Spacesaver II Keyboard	---
10K38xx	10K3849	---	106-key Preferred USB Keyb. with 2-port USB Hub (S/Black)	---
22P51xx	22P5150	---	TrackPoint USB Spacesaver Keyboard	---
28L3675	28L3673	---	Sleek 2-button Mouse (S/Black)	---

12. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

13. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 55=France, 56=Germany, 57=Italian, 58=Norwegian, 59=Swedish/Finnish, 10K2343=Swiss, 10K2344=UK English, 10K2345=US ISO.

14. Where 'xx' represents a specific country code as follows:- 53=Danish , 54=Dutch, 68=French, 55=German, 56=Italian, 57=Spanish, 58=UK English, 59=Swedish/Finnish, 60=Belgian/English, 61=Russian, 62=Polish, 63=Portuguese, 65=Swiss, 67=US International.

Note 15  
Note 16

xSeries 440 Tape Options				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
21P99xx	4560SLX	---	SDLT/LTO Modular Tape Library	---
24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---
03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---

15. Where 'xx' represents a country specific power cord code: 72=UK, 73=EU1, 74=Denmark, 75=India/South Africa, 76=Swiss, 77=Italy, 78=Israel.

16. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM xSeries 440

Part Number<sup>1, 15</sup>    Withdrawal Date<sup>17</sup>    Processor Speed (GHz)    Number of Processors (Std/Max)<sup>8</sup>    L3 ECC Cache    Memory (Std/Max)<sup>9</sup>    Form Factor    Power Supply Quantity (Std/Max)<sup>11</sup>    Hot-Swap (Power, Slots, HDD, Fans)    Redundancy (Optional, Standard)    System Management Adapter<sup>12</sup>    Onboard Ethernet (Mbps)    SCSI Controller (Dual, Ultra, RAID)    Removable Media Bays (Total/Avail)    Internal HDD Storage (Total/Avail)    CD-ROM (IDE)<sup>13</sup>    Bays (Total/Avail)    Slots (Total/Avail)<sup>14</sup>

xSeries 440 At-A-Glance																	
8687-1RX <sup>2, 16</sup>	25-Mar	1.4 <sup>4</sup>	2/8	512KB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-2RX <sup>2, 16</sup>	25-Mar	1.5 <sup>4</sup>	2/8	512KB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-3RX <sup>2, 16</sup>	25-Mar	1.6 <sup>4</sup>	2/8	1MB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-4RX <sup>2, 16</sup>	-	1.5 <sup>5</sup>	2/8	1MB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-5RX <sup>2, 16</sup>	-	1.9 <sup>5</sup>	2/8	1MB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-6RX <sup>2, 16</sup>	-	1.9 <sup>5</sup>	4/8	1MB	4GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-7RX <sup>2, 16</sup>	-	2 <sup>5</sup>	4/8	2MB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-3RY <sup>2</sup>	-	2.4 <sup>6</sup>	2/4	512KB	2GB/32GB <sup>9</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-4RY <sup>2</sup>	-	2.4 <sup>6</sup>	4/4	512KB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-1VX <sup>3</sup>	-	1.4 <sup>7</sup>	8/8	512KB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-2VX <sup>3</sup>	-	1.5 <sup>7</sup>	8/8	512KB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-3VX <sup>3</sup>	-	1.6 <sup>7</sup>	8/8	1MB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-4VX <sup>3</sup>	-	1.5 <sup>7</sup>	8/8	1MB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-5VX <sup>3</sup>	-	1.9 <sup>7</sup>	8/8	1MB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6
8687-7VX <sup>3</sup>	-	2 <sup>7</sup>	8/8	2MB	4GB/32GB <sup>10</sup>	Rack (4U)	2/2	P, S, H, F	S-Fans, S-Power	Y	10/100/1000	D, U160	2/0	0/146.8GB	24x-10x	4/2	6/6

Note: Refer to the Datacenter Solutions section for additional xSeries 440 models configured with Microsoft Windows 2000 Datacenter Server (licensed for up to 16 processors).

- Housed in a 19in rack-mountable drawer and ships standard without a keyboard or mouse. See Rack Cabinets and Options section for supported IBM racks.
- This xSeries 440 model supports the IXA Adapter (P/N 1519100) for connection to iSeries models for Microsoft Windows 2000 Server and Advanced Server. The adapter must be installed in PCI slot two only.
- This model supports VMware ESX Server 1.5 for 16 processors (P/N 481716X) only. A list of operating systems supported by VMware is available at [www.vmware.com/products/server/esx\\_features.html](http://www.vmware.com/products/server/esx_features.html) (go to VMware.com, click Products, then Servers). Standard features in each chassis include eight Xeon processors, eight RDIMMs, two SMP Expansion Modules, two 2.5m and one 250mm scalability cables, and an Ethernet crossover cable for use if both systems are not connected to an enterprise network. This model must be purchased with a matching model as a set of two chassis that operate as a single system through scalability cables and BIOS settings.
- Intel Xeon MP processor with integrated full-speed ECC L3 cache and 4x100MHz (quad-pumped) access to memory and I/O buses. Not compatible with models 4-7RX.
- Intel Xeon MP processor with integrated full-speed ECC L3 cache and 4x100MHz (quad-pumped) access to memory and I/O buses. Not compatible with models 1-3RX.
- Intel Xeon DP processor with integrated full-speed ECC L2 cache and 4x100MHz (quad-pumped) access to memory and I/O buses. A maximum of two processors can be installed in each SMP Expansion Module (four total per system).
- Intel Xeon MP processor with integrated full-speed ECC L3 cache and 4x100MHz (quad-pumped) access to memory and I/O buses. Models 1 ... 7VX include eight processors installed standard in two SMP Expansion Modules (processors installed in models 1 ... 3VX are different from models 4 ... 7VX and mutually incompatible). These models must be purchased with a matching eight-way model totalling 16 processors in two chassis connected with six standard copper-colored SMP expansion cables (two 2.5m and one 250mm cables with each model). Sixteen-way capable xVX models are sold only in pairs, not separately.

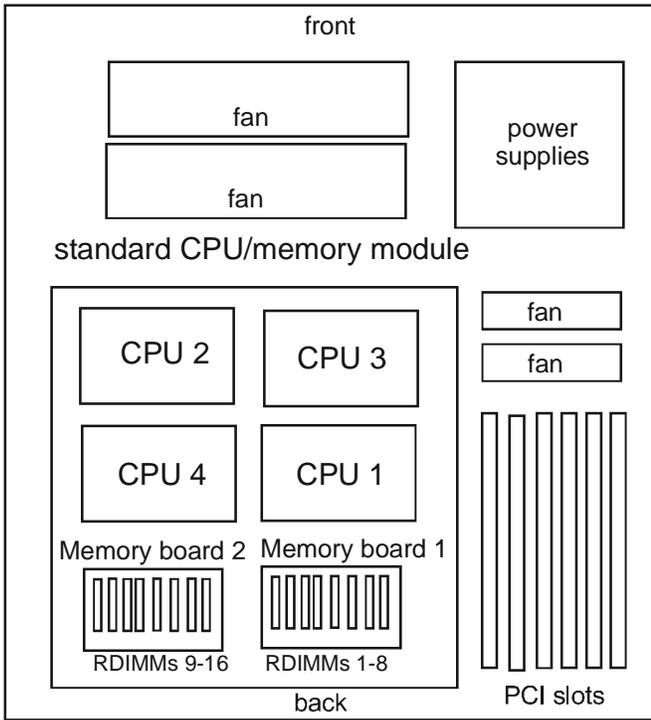


8. Either two or six additional optional processors are supported in models 1 ... 3RX. In these models, xSeries SMP Expansion Module (P/N 59P5188) is required to increase maximum support of processors from four to eight and memory options from 16 to 32. The optional SMP Expansion Module requires four processors prepopulated and a minimum of four RDIMMs (eight if memory mirroring is enabled). In models 3RY and 4RY, a maximum of two processors can be installed in each SMP Expansion Module (memory options can be added as with models 1 ... 3RX). Model 3RY ships with two processors installed in a single SMP Expansion Module. Model 4RY contains two SMP Expansion with two processors installed in each. Both models 3RY and 4RY can be upgraded by replacing the standard Xeon DP processors with Xeon MP processors, which then allows all functionality and compatibility of models 1 ... 3RX. Models 1 ... 7VX are sold only in matching pairs of eight-way models with two standard SMP Expansion Modules populated with four RDIMMs each totalling 16 processors and eight RDIMMs.
9. Advanced Chipkill ECC memory controller corrects single, two-, three-, and four-bit memory errors. Memory options are four-way interleaved. Sixteen sockets are provided in standard models, four of which are populated with 512MB RDIMMs in models 4RX, 5RX and 7RX and with 1GB RDIMMs in model 6RX. An additional 16 sockets are supported with the installation of xSeries SMP Expansion Module (P/N 59P5188).
10. Advanced Chipkill ECC memory controller corrects single, two-, three-, and four-bit memory errors. Memory options are four-way interleaved. Thirty-two sockets are provided in standard models, eight of which are populated with 512MB RDIMMs (four in each SMP Expansion Module).
11. Two 1050w, voltage-sensing, hot-swap power supplies that support N+1 redundancy on full configurations are standard.
12. Advanced system management is provided by a standard Remote Supervisor Adapter installed in a dedicated PCI slot, which allows six optional PCI adapters to be installed.
13. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
14. Support for an additional 12 64-bit slots available through installation of the optional RXE-100 Remote Expansion Unit. Refer to x440 I/O Options or the RXE-100 section for more information. RXE-100 support for 16-way x440 is delayed until late 1Q03.
15. Availability in the U.S. is limited to the Large Enterprise Direct (LED) program or through EXAct Business Partner program members.
16. Upgrading this system to enable 16-way configuration requires either 4-way to 16-way Enablement Kit (P/N 73P8734) or 8-way to 16-way Enablement Kit (73P8735).
17. Not available from IBM after this date. Business Partner inventory may be available.

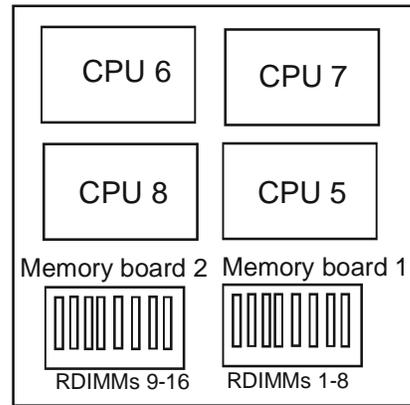
### xSeries 440 Processors

Part Number	Processor Upgrades <sup>1</sup>	SMP Support <sup>2</sup>	Processor Speed/Cache Upgrade <sup>3</sup>
32P8705	xSeries 1.4GHz/400MHz-512KB L3 Cache with Xeon Processor MP	1RX	-
32P8706	xSeries 1.5GHz/400MHz-512KB L3 Cache with Xeon Processor MP	2RX	1RX
32P8707	xSeries 1.6GHz/400MHz-1MB L3 Cache with Xeon Processor MP	3RX	1RX, 2RX
59P5171	xSeries 1.5GHz/400MHz-1MB L3 Cache with Xeon Processor MP	4RX	-
59P5172	xSeries 1.9GHz/400MHz-1MB L3 Cache with Xeon Processor MP	5RX, 6RX	4RX
59P5173	xSeries 2GHz/400MHz-2MB L3 Cache with Xeon Processor MP	7RX	5RX, 6RX
59P5188	xSeries SMP Expansion Module <sup>4</sup>	1 ... 7RX	3RY, 4RY
71P7919	xSeries SMP Expansion Module with Dual Xeon Processors 2.4GHz/512KB <sup>5</sup>	3RY	-
73P8734	4-way to 16-way Enablement Kit	-	1 ... 7RX
73P8735	8-way to 16-way Enablement Kit	-	1 ... 7RX

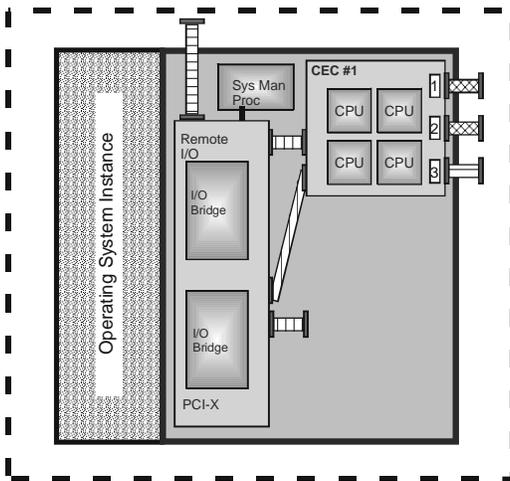
1. IBM xSeries 440 architecture optimizes memory and bus performance using an XA-32 core chipset with up to two CPU/memory cards and two PCI-X host-bridge controllers. Up to eight Pentium Xeon MP processors are supported. The recommended order of processor installation is shown in the accompanying diagrams (not applicable for models 3RY and 4RY, which support two processors only in each SMP Expansion Module installed in the two sockets located adjacent to the memory ports). In models 1 ... 5RX, two processors are standard with additional support for either two optional processors (total of four) or six optional processors (total of eight). In models 6RX and 7RX, four processors are standard and four additional processors and an SMP module are required when upgrading. Eight processors require an xSeries SMP Expansion Module. Models 2RY and 3RY are limited to two Xeon DP processors in each SMP Expansion Module, but can be upgraded by replacing the standard processors with Xeon MP processors.
2. A maximum of eight processors may be installed. All processors must be identical in type, speed and cache size. The fifth through eighth processors require an xSeries SMP Expansion Module prepopulated with four processors (second SMP Expansion Module supported only when fully populated).
3. Requires removal of standard processors. A maximum of eight processors may be installed. Installation of greater than four processors requires the addition of an xSeries SMP Expansion Module. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access [www.pc.ibm.com/support](http://www.pc.ibm.com/support) and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS."
4. The fifth through eighth processors for models 1 ... 7RX require this option, which installs directly above the standard CPU/memory board. Two 250mm/10in scalability cables (P/N 24P1243) are included with the option. See SMP Expansion Module cabling diagrams below for scalability cabling configuration. Four CPUs are required with the optional SMP Expansion Module for models 1 ... 7RX. A minimum of four RDIMMs installed in each SMP Expansion Module are required (not included). Memory mirroring requires a minimum of eight RDIMMs in each SMP Expansion Module. This option is not compatible with models 3RY and 4RY. Models 1VX, 2VX and 3VX include two standard SMP Expansion Modules in each chassis fully populated with a total of 16 processors (four in each of two SMP Expansion Modules for a total of eight in each chassis), one 250mm scalability cable (P/N 24P1243), two 2.5m scalability cables (P/N 73P6290), and an Ethernet crossover cable (used only in the absence of network connections for both chassis).
5. Required to upgrade 3RY from two to the maximum of four Xeon DP processors. Memory options are not included. Both models 3RY and 4RY can be upgraded by replacing the standard processors with Xeon MP processors. The same SMP Expansion Module is used, which supports up to four Xeon MP processors.



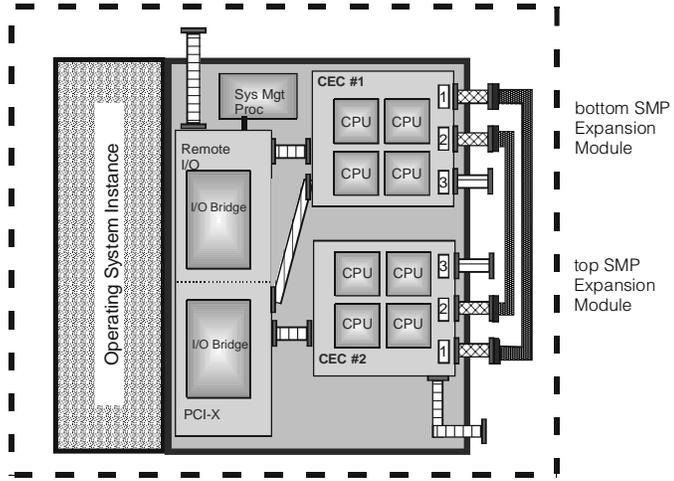
Optional SMP Expansion Module (P/N 59P5188) installs directly above standard CPU/memory board, requiring installation of four processors and a minimum of four RDIMMs. Standard with eight- and 16-way models.



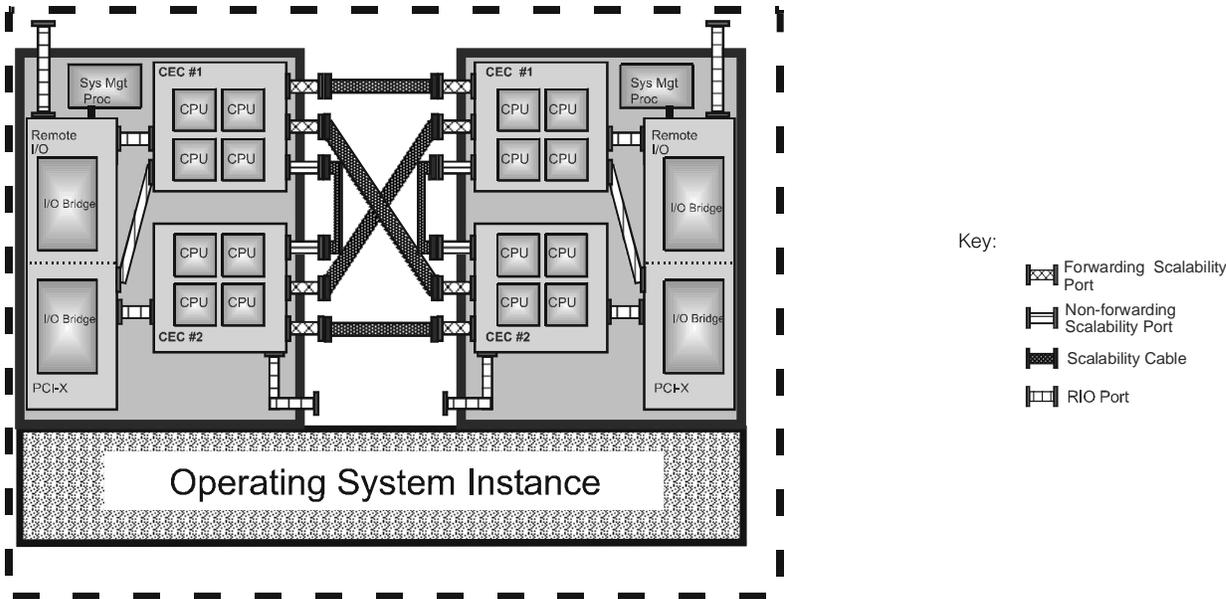
Logical diagram of SMP Expansion Module cabling for single node, four-way x440 running one operating system



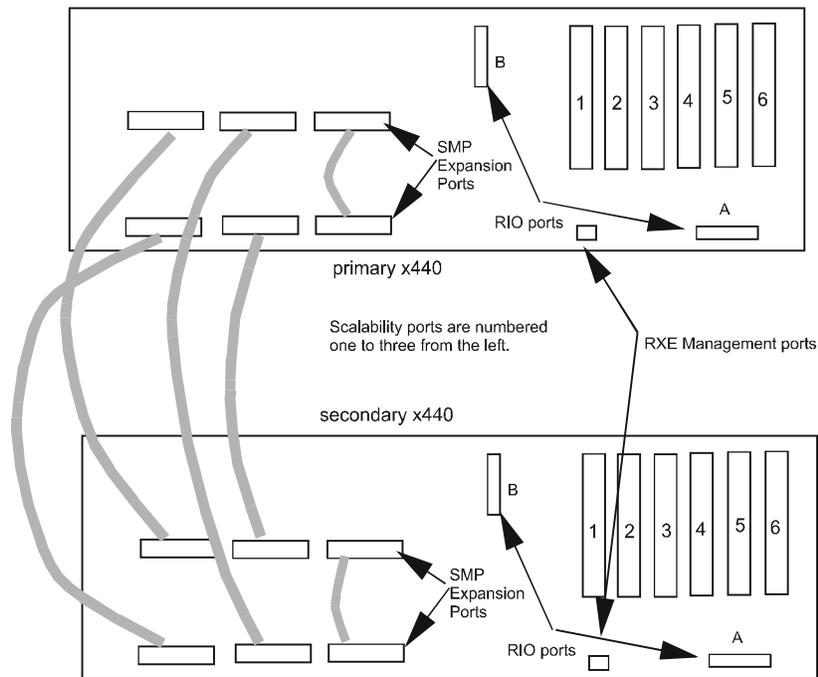
Logical diagram of SMP Expansion Module cabling (including scalability cables) for single node, eight-way x440 running one operating system



Logical Diagram of SMP Expansion Module cabling for 16-way x440 (two eight-way models) running one operating system. The top SMP Expansion Modules in each chassis are labeled CEC #1. Scalability ports are shown top to bottom one to three.



**SMP Expansion cabling configuration (rear view of system chassis')**



IBM xSeries 440



## xSeries 440 Memory

Part Number	Memory Description <sup>1</sup>
33L3324	512MB PC133 ECC SDRAM RDIMM
31P8300	1 GB PC133 ECC SDRAM RDIMM

1. Due to four-way interleaving, installation of memory options in banks of four is required. Banks may be populated in any order. A minimum of four RDIMMs are required for each SMP Expansion Module (minimum of eight required to enable memory mirroring).

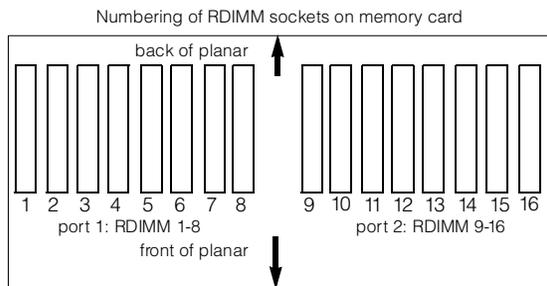
Notes:

1. See numbering of RDIMM sockets on memory card for bank configuration.

2. Performance is optimized by balancing the amount of memory between ports (and between SMP Expansion Modules).

3. In order to enable memory mirroring during BIOS set-up, the same memory configuration must be installed in each port (memory mirroring reduces the amount of memory available to the operating system by half).

4. Memory mirroring is specific to each SMP Expansion Module, i.e., it is not required in both the standard and optional CPU/memory boards.



Bank 1: sockets 1, 3, 5, 7  
 Bank 2: sockets 9, 11, 13, 15  
 Bank 3: sockets 2, 4, 6, 8  
 Bank 4: sockets 10, 12, 14, 16

Total Memory <sup>1</sup>	Quantity of RDIMMs Added <sup>2, 4</sup>	
	2GB (4x512MB) <sup>3</sup>	1GB (31P8300)
4GB <sup>3</sup>	4	-
6GB	8	-
8GB	12	-
10GB	8	4
12GB	4	8
14GB	-	12
16GB <sup>4</sup>	28	-
18GB <sup>4</sup>	24	4
20GB <sup>4</sup>	20	8
22GB <sup>4</sup>	16	12
24GB <sup>4</sup>	12	16
26GB <sup>4</sup>	8	20
28GB <sup>4</sup>	4	24
30GB <sup>4</sup>	-	28
32GB <sup>5</sup>	-	32

This table does not represent all possible memory configurations. RDIMMs must be added in sets of four to support interleaving technology.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.

2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row, which will be added to the standard memory noted at the top of the left column.

3. Model 4R<sub>Y</sub> ships with 4GB of memory standard (4 x 512MB RDIMMs installed in each SMP Expansion Module).

4. Optional xSeries SMP Expansion Module (P/N 01R1338) is required if total RDIMMs exceed 16.

5. Requires removal of standard memory. Installation of greater than 16 RDIMMs requires optional xSeries SMP Expansion Module (P/N 01R1338).

## xSeries 440 Internal SCSI Cabling

xSeries 440 provides four drive bays on the lower front panel of the system chassis. At the bottom, two adjacent slim-line bays contain the standard CD-ROM and a 1.44MB diskette drive. Two 3.5in, SCA-2-compliant slim-line hot-swap hard disk drive bays are located directly above. The IDE CD-ROM is cabled directly to the IDE port on the planar, and the hot-swap backplane that supports two hot-swap bays is connected to one channel of the dual channel integrated SCSI controller through a 16-bit LVDS cable.

An optional ServerRAID controller is supported for internal and external RAID applications. An additional, longer 16-bit LVDS SCSI cable is provided standard with the system to connect the hot-swap backplane to the ServerRAID controller for internal RAID configurations. The integrated controller includes a second channel that supports external tape enclosures. A 16-bit LVDS cable connects this channel to an industry-standard, 0.8mm VHDCI connector.

**For additional information regarding internal cabling, refer to Appendix F: Internal Cabling Overview.**



**xSeries 440 Hard Disk Drive (HDD) Storage**

Total Internal Storage <sup>1</sup>	10,000rpm HDDs			15,000rpm HDDs	
	18.2GB (06P5754)	36.4GB (06P5755)	73.4GB (06P5756)	18.2GB (06P5767)	36.4GB (06P5768)
0GB	Standard on base models				
18.2GB	1	-	-	1	-
36.4GB	2	1	-	2	1
72.8GB	-	2	-	-	2
73.4GB	-	-	1	-	-
146.8GB (max)	-	-	2	-	-

This table does not represent all possible HDD configurations. Total internal storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.

Part Number	Description	RPM	Height	Bays Supported <sup>1</sup>	Maximum Quantity
<b>Hot-swap Ultra160 SCSI HDDs</b>					
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1, 2	2
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1, 2	2
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1, 2	2
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1, 2	2
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1, 2	2
<b>Removable Media<sup>2</sup></b>			<b>Bays Supported</b>		
08K9603	ThinkPad Removable Diskette Drive <sup>3</sup>	3			
05K9233	ThinkPad 24X-10X CD-ROM Ultrabay 2000 Drive <sup>4</sup>	3, 4			
22P9102	ThinkPad Ultralight 8X DVD-ROM Ultrabay 2000 Drive <sup>5</sup>	3, 4			
<b>External Storage Expansion Units<sup>6</sup></b>			<b>Form Factor</b>		
35311RU	EXP300 Storage Expansion Unit <sup>7</sup>	Rack (3U)			
17401RU	FASiT EXP700 Storage Expansion Unit <sup>8</sup>	Rack (3U)			
35601RU	FASiT EXP500 Storage Expansion Unit <sup>9</sup>	Rack (3U)			
35421RU	FASiT200 Storage Server <sup>10, 11</sup>	Rack (3U)			
35422RU	FASiT200 HA Storage Server <sup>10</sup>	Rack (3U)			
19K1121	FASiT200 Redundant RAID Controller	-			

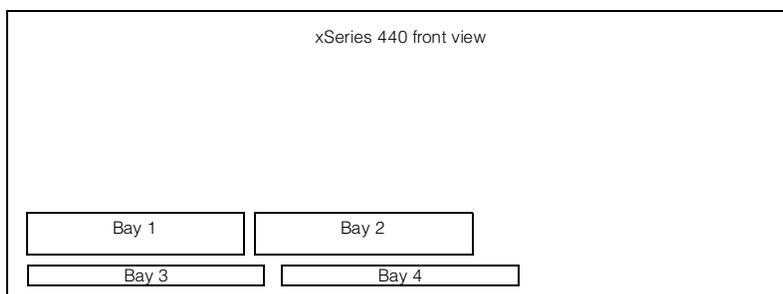
1. HDD bays in the secondary server in 16-way configurations do not support boot disks.
2. Removable media bays in the secondary server in 16-way configurations are disabled.
3. Installed standard in bay 3. Not compatible with bay four.
4. Installed standard in bay four.
5. Install in either bay three or four, requiring removal of standard devices. If only one optical drive is installed, it must be installed in bay four. If a second optical drive is installed, use bay three configured as slave.
6. Not supported by the onboard external SCSI port, which supports external tape enclosures only. External SCSI HDD storage requires a RAID controller. Fibre Channel HDD storage requires a Fibre Channel controller. For HDD expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.
7. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.
8. FASiT EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.
9. FASiT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350W power supplies, each with its own power cord.
10. The FASiT200 includes two hot-swap, 350W auto-ranging redundant power supplies, each with its own power cord.
11. Can be upgraded to FASiT200 HA Storage Server through the addition of a FASiT200 Redundant RAID Controller (P/N 19K1121).

IBM xSeries 440

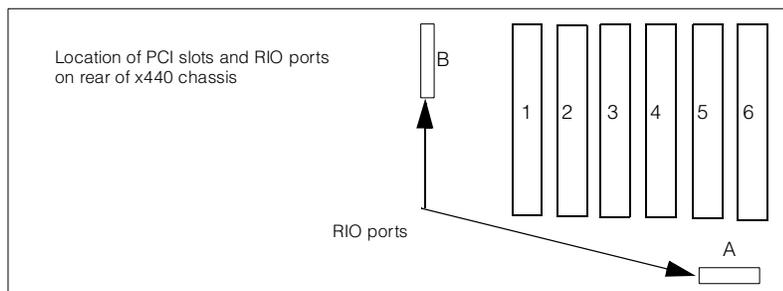


Bay	Form Factor	Height	Front Access	Usage
1, 2 <sup>1</sup>	HS	SL	Yes	open
3	133mm (5.25in)	SL <sup>2</sup>	Yes	FDD
4	133mm (5.25in)	SL <sup>3</sup>	Yes	CD-ROM

1. HDD bays in the secondary server in 16-way configurations do not support boot disks.
2. Supports FDD, high-density FDD, CD-ROM, CD-RW or DVD-ROM. If an IDE device (optical drive) is installed, must be configured as slave.
3. Supports CD-ROM, CD-RW or DVD-ROM. Must be configured as master if bay three contains an optical drive. If only one optical drive is installed, it must be installed in bay four. In 16-way configurations, bays three and four are disabled in the secondary chassis.



### xSeries 440 I/O Options



- Slot 1: Bus A, 66MHz, 64-bit, full-length, 3.3v
- Slot 2: Bus A, 66MHz, 64-bit, full-length, 3.3v
- Slot 3: Bus B, 100MHz, 64-bit, full-length, 3.3v
- Slot 4: Bus B, 100MHz, 64-bit, full-length, 3.3v
- Slot 5: Bus C, 133MHz, 64-bit, full-length, 3.3v
- Slot 6: Bus D, 133MHz, 64-bit, full-length, 3.3v

Optimal order of installation (highest frequency adapters first): 6-5-4-2-3-1

Scan sequence (up to eight-way):

Inside the server: slots 1, 2, 6, 5, 3, 4

Continuing in an RXE-100: slots 11, 12, 9, 10, 7, 8, 17, 18, 15, 16, 13, 14.

Scan sequence (16-way):

Inside the primary server: slots 1, 2, 3, 4, 5, 6

Standard 6-slot Expansion Kit in the RXE-100: slots 7, 8, 9, 10, 11, 12

Inside the secondary server: slots 13, 14, 15, 16, 17, 18

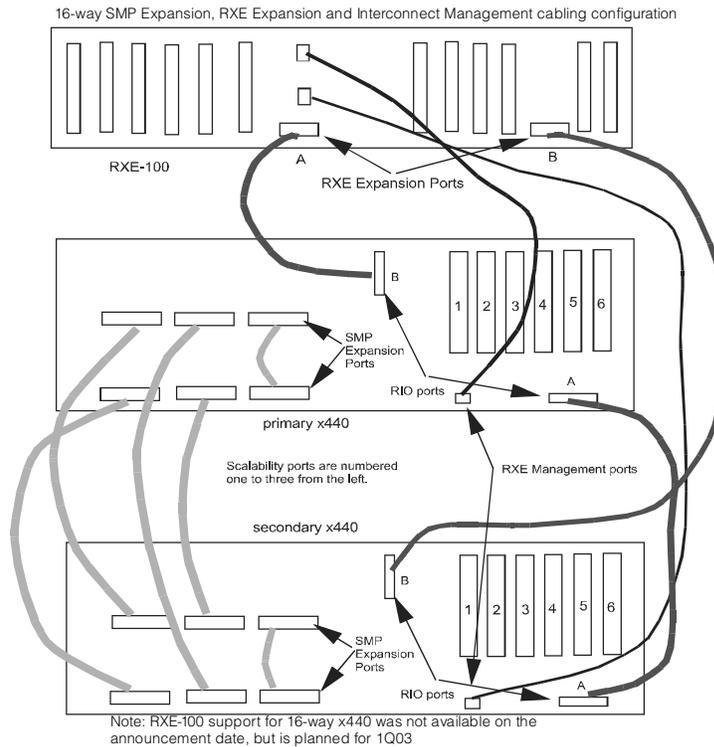
Second 6-slot Expansion Kit in the RXE-100: slots 19, 20, 21, 22, 23, 24



Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Slots Supported <sup>1</sup>	Hot-Plug <sup>2</sup>	PCI Voltage Key	MHz
<b>Storage Controllers<sup>3</sup></b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	1 ... 6	X	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	1 ... 6	X	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>6</sup>	Half	64-bit	1 ... 6	X	Universal	66
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>7</sup>	Half	32-bit	1 ... 6	-	Universal	66
<b>Fibre Storage Controllers and Options<sup>8</sup></b>							
00N6881	FASiT Host Adapter	Half	64-bit	1 ... 6	X	Universal	66
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	1 ... 6	X	Universal	133
174290U	FASiT900 Storage Server (US line cord)	-	-	-	-	-	-
17421RU	FASiT700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FASiT500 Storage Server	-	-	-	-	-	-
35421RU	FASiT200 Storage Server	-	-	-	-	-	-
35422RU	FASiT200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port (2Gb)	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>9</sup>	-	-	-	-	-	-
<b>Networking<sup>10</sup></b>							
<b>Ethernet<sup>11</sup></b>							
06P3601	10/100 Ethernet Server Adapter <sup>12</sup>	Half	32-bit	1 ... 6	X	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>12</sup>	Half	64-bit	1 ... 6	X	Universal	66
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter	Half	64-bit	1 ... 6	X	Universal	133
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>12</sup>	Half	64-bit	1 ... 5	X	Universal	133
<b>Token Ring</b>							
34L5001	16/4 Token-Ring PCI Management Adapter <sup>12</sup>	Half	32-bit	1 ... 6	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter <sup>12</sup>	Half	32-bit	1 ... 6	X	Universal	33
<b>System Management<sup>13</sup></b>							
03K9309	Advanced System Management Interconnect Cable Kit <sup>14</sup>	-	-	-	-	-	-
<b>Remote I/O Expansion</b>							
8684-1RX	RXE-100 Remote Expansion Enclosure <sup>15, 16</sup>	-	-	-	-	-	-

Note: xSeries 440 supports the IXA Adapter (P/N 1519100) for connection of two-, four- and eight-way systems to iSeries models for Microsoft Windows 2000 Server and Advanced Server. The adapter must be installed in PCI slot two only.

- Adapters rated at a lower frequency than the slots in which they are installed will reduce the bus to the frequency of the slowest adapter. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.
- All six slots are full-length hot-plug capable. For network operating system support, access [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat).
- xSeries 440 includes an integrated dual channel Ultra160 SCSI controller with one external and one internal connector. See Internal SCSI Cabling or Internal Cabling Overview for cabling alternatives. When a RAID controller is installed as a boot disk, it must be installed in a slot that is scanned before other RAID controllers in the configuration. Refer to the scan sequence provided in this section.
- ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache. The two internal connectors are not accessible due to a cabling interference. Four external Ultra160 0.8mm VHDCI connectors are available.
- ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used). External connectors are 0.8mm VHDCI.
- ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
- PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. This system supports external connection only.
- See Fibre Channel Solutions Overview section for additional configuration information.
- The 2108R3L SAN Data Gateway Router Ultra SCSI LVD port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).
- xSeries 440 has an integrated Broadcom-based 10/100/1000 PCI Ethernet controller (copper). Wake on LAN is supported for the integrated controller (at 10/100Mb only).
- In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. Two of the optional PCI Ethernet adapters listed are copper and Intel-based (P/N 06P3601, 22P4901) and two are Broadcom-based (22P7801, 31P6301).
- The Wake on LAN function of this option is supported by this server if the latest firmware is installed.
- xSeries 440 includes a Remote Supervisor Adapter (RSA) installed in a dedicated PCI slot with an external connector, leaving six PCI slots available for optional adapters. Support for connection to other servers requires an optional Advanced System Management Interconnect Cable Kit (P/N 03K9309). Direct connection to the RXE drawer management controller in an RXE-100 Remote Expansion Enclosure is supported through a standard Interconnect Management Cable Kit with 3.5m cable. An 8m optional cable is available. Sixteen-way configurations provide an Ethernet crossover cable to connect the Ethernet ports in the RSAs in each chassis if they are not connected to an Ethernet LAN. All system management functionality supported by the RSA is provided for both the primary and secondary servers through the Ethernet connection on the RSA. The RS485 port is only required when the 16-way x440 configuration is interconnected to support additional systems with the x440 standard RSA serving as a focal point for those systems.
- Required to connect the standard Remote Supervisor Adapter to an interconnect network with other servers for system management support through a single LAN or modem connection. Up to 24 Integrated System Management Processors or Remote Supervisors Adapters may be interconnected with an aggregate connection length of no more than 91.4m (300ft). This interconnect network of 24 devices may also include a maximum of 12 Advanced System Management Processors or Advanced System Management PCI Adapters. A customer-supplied Cat5 cable is required for each interconnection. System management RS485 interconnect network connections for sixteen-way configurations are not required unless the RSA in the 16-way x440 configuration is a focal point for additional systems.
- RXE-100 Remote Expansion Enclosure supports up to 12 additional PCI-X slots. Cable required for connection included with expansion unit, which attaches to a standard integrated RIO port located on the back of the x440 chassis. An optional longer cable is available. Refer to RXE-100 section for diagrams and supported options.
- xSeries 440 supports only one RXE-100 for all server configurations. Two- and four-way systems use only RIO port A because port B is inactive unless a second SMP Expansion Module is installed. Only one RIO connection to the RXE-100 is supported for both four- and eight-way systems. Sixteen-way systems require a connection from each server and an interconnection between the servers. RXE-100 support for 16-way x440 is delayed until late 1Q03.



### xSeries 440 Power, Monitors & Accessories

Part Number	Description
<b>Power<sup>1</sup></b>	
<b>Uninterruptible Power Supply (UPS)<sup>2, 3</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>4</sup>
2130R31	UPS3000XHV <sup>4</sup>
32P1692	UPS Extend Run Battery Pack <sup>4</sup>
37L6861	APC Smart-UPS 5000RMB <sup>5</sup>
<b>Monitors<sup>6</sup></b>	
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>7</sup>
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
66274AN	G78 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>7</sup>
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver keyboard) <sup>8</sup>
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard) <sup>8</sup>

1. xSeries 440 systems include two 1050W, hot-swap power supplies with two 2.8m/9ft IEC 320-C13 to IEC 320-C14 power cables for intrarack power distribution. Models shipped in the US also include two 2.8m/9ft IEC 320-C13 to NEMA 6-15P power cords for attachment to high voltage power sources. Power supply redundancy is standard for all configurations with a high voltage power source. If a low voltage source is used, power supplies operate at 550w and redundancy is supported only for configurations with two processors (low voltage is not supported for 16-way installations).

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

3. Because the x440 is not equipped with an external serial port, UPS remote management (except for UPS3000XLV, HV) requires a USB to serial adapter such as the Belkin USB to Serial Adapter (P/N 10K3661), which is available at [www.pc.ibm.com/ww/eserver/xseries](http://www.pc.ibm.com/ww/eserver/xseries). Select Accessories, Upgrades & Monitors and the country, then click Go. Scroll to the bottom of the page, select Cables and Adapters, then open the Adapters pull-down menu. UPS3000XLV, HV (P/N 2130R30, 1) supports USB connections between the server and UPS. USB connections are not supported in 16-way configurations.

4. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.

5. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.

6. xSeries 440 uses an SVGA controller (S3 Savage4 LT chipset) with 8MB of video memory. Optional video adapters are not supported. Sixteen-way configurations support console connections only through the primary chassis.

7. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).

8. Includes a 15in Flat Panel Monitor.



Part Number	Description
<b>Rack and NetBAY<sup>1, 2</sup></b>	
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.
<b>Console Connectivity<sup>2, 3</sup></b>	
1735L04	NetBAY Local Console Manager
1735R16	NetBAY Remote Console Manager
32P1636	250mm KVM Conversion Option
32P1652	1.5m KVM Conversion Option
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
<b>Keyboard and Mouse<sup>2, 4</sup></b>	
28L3644	Space Saver II Keyboard <sup>5, 6</sup>
22P5150	TrackPoint USB Space Saver Keyboard <sup>5, 6, 8</sup>
10K3849	106-key Preferred USB Keyboard with 2-port USB Hub (stealth black) <sup>7, 8</sup>
28L3673	Sleek 2-Button Stealth Black Mouse
33L3244	Sleek USB Mouse (stealth black) <sup>8</sup>

1. xSeries 440 is housed in a 19in rack-mountable drawer and requires one of the racks listed in the Rack Cabinets and Options section.
2. Sixteen-way configurations support console connections only through the primary chassis.
3. Refer to the Rack Console Options section for information regarding console connectivity using these options.
4. xSeries 440 supports rack configurations only and ships without a keyboard or mouse. The system includes three USB ports (one on front of chassis), SVGA video port, mouse port and keyboard port. USB ports are not active on the secondary server in 16-way configurations. Only PS/2 devices are supported in 16-way configurations, attached to the primary server only.
5. Installation within a rack requires optional keyboard tray (P/N 28L4707) which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).
6. Advanced TrackPoint IV features are not available on IBM xSeries systems.
7. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.
8. USB accessories attach to a single USB-capable server. They are not compatible with the NetBAY console switches. Sixteen-way configurations require a PS/2 connector for keyboard, video and mouse.

### xSeries 440 Tape Options

Part Number	Tape Drives	Bays Supported <sup>1</sup>	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
24P2396	100/200GB LTO Half-High Tape Drive <sup>7</sup>	-	16 Ultra2 LVD	133mm (5.25in) HH	Y <sup>2</sup>	3551001 <sup>3</sup>
59P6736	160/320GB SDLT Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	Y <sup>2</sup>	3503B1X
<b>External Tape Libraries<sup>4</sup></b>						
4560SLX	SDLT/LTO Modular Tape Library	-	16 Ultra2 LVD	5U Rack	Y	-
<b>External Tape Enclosures</b>						
3551001	NetMEDIA Storage Expansion Unit EL <sup>5</sup>	-	16 LVD	Rack	Y	-
3503B1X	Full-High SCSI Tape Enclosure <sup>6</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-

1. IBM xSeries 440 does not support internal tape drives. An external tape library or tape enclosure must be used. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8mm VHDCI connector. Select tape drive, enclosure and controller then use Appendix D: Cables - Storage Units - Controllers to select an appropriate external cable.
2. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.
3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.
6. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016
7. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.



## xSeries 440 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### Basic SCSI Configuration

Part Number	Description	Quantity
8687-1RX	xSeries 440 2x1.4GHz/512KB Xeon, 2GB ECC, open, 24X (4U rack)	1
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller	1 <sup>1</sup>
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black	1
37L6861	APC Smart-UPS 5000RMB	1
<b>External Storage</b>		
35311RU	EXP300 Storage Expansion Unit	2
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	6 <sup>2</sup>
<b>Rack Options</b>		
9306110	NetBAY 11 Standard Rack Cabinet	1
28L3644	Space Saver II Keyboard	1

1. External connectors only can be used due to internal cabling restriction.

2. Six HDDs are used for RAID-5E protection in each EXP300. One HDD is identified as a hot-spare. Effective capacity is five HDDs in the storage enclosure (total of 91GB).

### High-availability SCSI Storage Solution<sup>1</sup>

Part Number	Description	Quantity
8687-2RX	xSeries 440 2x1.5GHz/512KB Xeon, 2GB ECC, open, 24X (4U rack)	1
32P8706	xSeries 1.5GHz/512KB L3 Cache with Xeon Processor MP	2 <sup>1</sup>
33L3324	512MB PC-133 ECC SDRAM RDIMM	12 <sup>2</sup>
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	2
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller	2
31P6301	NetXtreme 1000 T Ethernet Adapter (copper)	1
37L6861	APC Smart-UPS 5000RMB	1
<b>External Storage</b>		
35311RU	EXP300 Storage Expansion Unit <sup>3</sup>	4
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	52 <sup>4</sup>
3551001	NetMEDIA Storage Expansion Unit EL	1
00N8016	100/200GB LTO Tape Drive	2
<b>Rack Options</b>		
9306420	NetBAY42 Standard Rack Cabinet	1
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (w/ US Space Saver Keyboard)	1
94G6670	Blank Filler Panel Kit	1

1. Total of four processors.

2. Total memory of 8GB.

3. Cables for daisy-chaining EXP300s not included in this table.

4. Thirteen HDDs are used for RAID-5E protection in each EXP300 (bay six remains empty in twintail high-availability EXP300 configurations). One HDD is identified as a hot-spare. Effective capacity is 12 HDDs in each storage enclosure (total of 946.4GB).



### Microsoft Exchange High-availability Fibre Channel Solution

Part Number	Description	Quantity
8687-3RX	xSeries 440 2x1.6GHz/1MB Xeon, 2GB ECC, open, 24X (4U rack)	1
19K4647	xSeries 1.6GHz/1MB L3 Cache Upgrade with Xeon Processor MP	6 <sup>1</sup>
59P5188	SMP Expansion Module	1
33L3324	512MB PC133 ECC SDRAM RDIMM	28 <sup>2</sup>
06P5736	ServeRAID-4Mx Ultra 160 SCSI Controller	1
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	2 <sup>3</sup>
31P6301	NetXtreme 1000 T Ethernet Adapter (copper)	1
24P0960	FC2-133 Host Bus Adapter	2
37L6861	APC Smart-UPS 5000RMB	1
2130R31	UPS3000XHV	1
<b>External Storage</b>		
17421RU	FASiT700 Storage Server	1 <sup>4</sup>
35601RU	FASiT EXP500 Storage Expansion Unit	4
06P5707	Netfinity 18.2GB 15Krpm FC Hot-Swap HDD	40
<b>Rack Options</b>		
9306420	NetBAY42 Standard Rack Cabinet	1
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (w/ US Space Saver Keyboard)	1
94G6670	Blank Filler Panel Kit	1

1. Total of eight processors (four per SMP Expansion Module).
2. Total memory of 16GB.
3. Total of two 18.2GB internal HDDs for NOS mirroring attached to a ServeRAID adapter.
4. Fibre Channel cable, SFP Modules and FASiT700 Mini Hubs not included.

### High-end High-availability Fibre Channel Solution

Part Number	Description	Quantity
8687-3VX	xSeries 440 8x1.6GHz/1MB Xeon MP, 4GB ECC, open, 24X (two - 4U rack)	2
33L3324	512MB PC133 ECC SDRAM RDIMM	48 <sup>1</sup>
06P5736	ServeRAID-4Mx Ultra 160 SCSI Controller	1
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	2 <sup>2</sup>
31P6301	NetXtreme 1000 T Ethernet Adapter (copper)	4
24P0960	FC2-133 Host Bus Adapter	2
37L6861	APC Smart-UPS 5000RMB	1
2130R31	UPS3000XHV	2
<b>External Storage</b>		
17421RU	FASiT700 Storage Server	1 <sup>3</sup>
17401RU	FASiT EXP700 Storage Expansion Unit	16
06P5761	2Gbps FC 36.4GB/10K Drive	224
<b>Rack Options</b>		
9306420	NetBAY42 Standard Rack Cabinet	2
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (w/ US Space Saver Keyboard)	1
94G6670	Blank Filler Panel Kit	2

1. Total memory of 32GB (16GB per chassis with 16 512MB RDIMMs per SMP Expansion Module).
2. Two 18.2GB internal HDDs installed in the primary chassis for NOS mirroring attached to a ServeRAID adapter.
3. Fibre Channel cable, SFP Modules and FASiT700 Mini Hubs not included.



# IBM RXE-100

## EMEA Part Number Cross Reference

RXE-100 System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
86841RX	86841RX	8684-1RX	RXE-100 Remote Expansion Enclosure	---

Notes 1&2  
Notes 3&2  
Notes 4&2  
Notes 5&2

RXE-100 Hard Disk Drive Storage Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---
00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
19K11xx	35421RU	---	FAST 200 Storage Server	---
19K11xx	35422RU	---	FAST 200 HA Storage Server	---

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

Note 6

RXE-100 Power, Monitors & Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION POWER	EMEA WDFM DATE
N/A	31P6108	---	370W Hot-Swap Redundant Power Supply	N/A
32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
32P1681	2130R30	---	UPS3000XLV	---
32P16xx	2130R31	---	UPS3000XHV	---
37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---

Note 7  
Note 8  
Note 9

- The RXE-100 Remote Expansion Enclosure ships with two Rack Power cords for connection to a high voltage UPS or PDU.
- Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.
- Only available in Saudi Arabia.
- Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.

EMEA Part Number Cross Reference

RXE-100 Tape Options				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
N/A	3570C2x	---	Magstar MP 3570 Tape Subsystem	N/A
24P24xx	3503B1X	---	Full-High SCSI Tape Enclosure	---
03K8756	3551001	---	NetMEDIA Storage Expansion Unit EL	---

Note 10

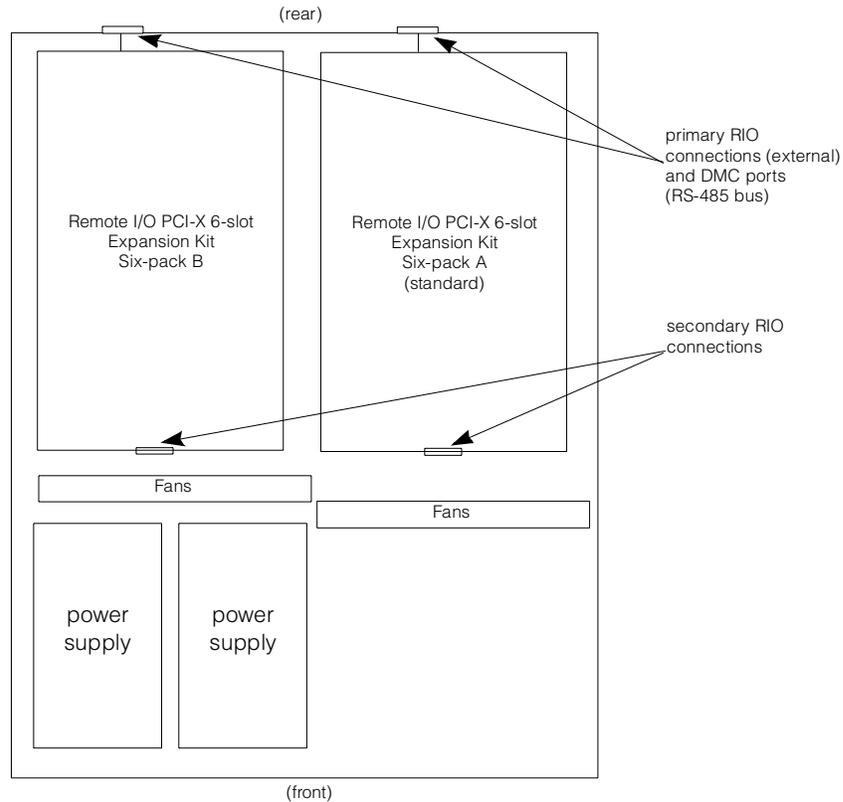
10. Where 'xx' represents a country specific code: 35=UK, 39=Swiss, 40=Italy, 41=Israel, 36=EU, 37=Denmark, 38=South Africa.



# IBM RXE-100 Remote Expansion Enclosure

<i>Part Number</i>	<i>Form Factor</i>	<i>Power Supply Quantity (Std/Max)</i>	<i>Hot-Swap (Power, Slots, HDD, Fans)</i>	<i>Redundancy (Optional, Standard)</i>	<i>System Management Controller</i>	<i>Standard Slots (Total/Avail)</i>	<i>Optional Slots (Total/Avail)</i>
<b>RXE-100 Remote Expansion Enclosure At-A-Glance</b>							
8684-1RX <sup>1</sup>	Rack (3U)	2/2	P, S, F	S - Fans S - Power <sup>2</sup>	Y <sup>3</sup>	6/6 <sup>4</sup>	6/6 <sup>5</sup>

1. Housed in a 19in rack-mountable drawer. See Rack Cabinets and Options section for supported IBM racks. Ships with one 3.5m Remote I/O Cable Kit (P/N 31P6102) and one 3.5m Interconnect Management Cable Kit (P/N 31P6087). Eight-meter cables are available as options (P/N 31P6103, 31P6088).
2. N+1 power supply redundancy is provided standard. Two 370w Hot-Swap Redundant Power Supplies (P/N 31P6108) ship installed in the RXE-100.
3. RXE-100 management controller interfaces with Remote Supervisor Adapter standard in xSeries 360 using the standard 3.5m Interconnect Management Cable Kit (P/N 31P6087) or the 8m option (P/N 31P6088).
4. RXE-100 ships with six full-length, 64-bit PCI-X slots supporting three 133MHz adapters or six 100MHz adapters. Adapters rated at 33 or 66MHz restrict PCI buses in which they are installed to the frequency of the slowest adapter.
5. Support for additional six 64-bit slots available through installation of the optional Remote I/O PCI-X 6-slot Expansion Kit (P/N 31P5998). Remote I/O connection is cabled internally within the RXE-100 enclosure using the secondary connector on each PCI-X 6-slot Expansion Kit, i.e., only one connection between the server and RXE-100 is required. Although the six slots are hot-swap, the expansion kit itself is not hot-swap.

**RXE-100 Remote Expansion Enclosure**
**P/N 8684-1RX**
**top view**


- Rack-mounted 3U enclosure that fits standard IBM racks.
- Contains six active PCI-X adapter slots with support for six optional slots (6-slot expansion kits are not hot-swap).
- Supports three 133MHz or six 100MHz adapters (backward compatible to 33 or 66MHz adapters).
- Interfaces directly to the host server memory controller.
- Interfaces with Remote Supervisor Adapter in the host server (jumper cable provided with Remote I/O PCI-X 6-slot Expansion Kit to connect second six-pack to the system management bus).
- Hot-swap redundancy for fans and power supplies (two 370W power supplies and four cooling fans).



## RXE-100 Remote Expansion Enclosure External HDD Storage

Part Number	External Storage Expansion Units <sup>1</sup>	Form Factor
35311RU	EXP300 Storage Expansion Unit <sup>2</sup>	Rack (3U)
17401RU	FAST EXP700 Storage Expansion Unit <sup>3</sup>	Rack (3U)
35601RU	FAST EXP500 Storage Expansion Unit <sup>4</sup>	Rack (3U)
35421RU	FAST200 Storage Server <sup>5, 6</sup>	Rack (3U)
35422RU	FAST200 HA Storage Server <sup>5</sup>	Rack (3U)
19K1121	FAST200 Redundant RAID Controller	-

1. To configure an external SCSI storage device, select an optional SCSI controller then refer to Appendix D: Cables - Storage Units - Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section. For Fibre Channel storage devices, refer to the Fibre Channel Solutions Overview section.

2. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500w redundant power supplies, each with its own power cord.

3. FAST EXP700 Storage Expansion Unit (P/N 17401RU) includes dual hot-swap 400w power supplies, each with its own power cord.

4. FAST EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350w power supplies, each with its own power cord.

5. The FAST200 includes two hot-swap, 350w auto-ranging redundant power supplies, each with its own power cord.

6. Can be upgraded to FAST200 HA Storage Server through the addition of a FAST200 Redundant RAID Controller (P/N 19K1121).



**RXE-100 Remote Expansion Enclosure I/O Options**

Part Number	Description	Adapter Length	PCI Support	Slots Supported <sup>1</sup>	Hot-Plug <sup>2</sup>	PCI Voltage Key	MHz <sup>3</sup>
<b>Storage Controllers</b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	1 ... 6	X	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>5</sup>	Full	64-bit	1 ... 6	X	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>6</sup>	Half	64-bit	1 ... 6	X	Universal	66
19K4646	PCI Wide Ultra 160 SCSI Adapter <sup>7</sup>	Half	32-bit	1 ... 6	-	Universal	66
<b>Fibre Storage Controllers and Options<sup>8</sup></b>							
00N6881	FASTT Host Adapter	Half	64-bit	1 ... 6	X	Universal	66
24P0960	FC2-133 Host Bus Adapter	Half	64-bit	1 ... 6	X	Universal	133
17421RU	FASTT700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FASTT500 Storage Server	-	-	-	-	-	-
35421RU	FASTT200 Storage Server	-	-	-	-	-	-
35422RU	FASTT200 HA Storage Server	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port (2Gb)	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>9</sup>	-	-	-	-	-	-
<b>Networking</b>							
<b>Ethernet</b>							
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1 ... 6	X	Universal	33
22P4901	10/100 Dual Port Server Adapter	Half	64-bit	1 ... 6	X	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>14</sup>	Half	64-bit	2, 4, 6	X	Universal	133
<b>Token Ring</b>							
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1 ... 6	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1 ... 6	X	Universal	33
<b>Associated Options</b>							
31P5998	Remote I/O PCI-X 6-slot Expansion Kit <sup>10</sup>	-	-	-	-	-	-
31P6088	8m Interconnect Management Cable Kit <sup>11</sup>	-	-	-	-	-	-
31P6103	8m Remote I/O Cable Kit <sup>12</sup>	-	-	-	-	-	-
31P6087	3.5m Interconnect Management Cable Kit <sup>13</sup>	-	-	-	-	-	-
31P6102	3.5m Remote I/O Cable Kit <sup>15</sup>	-	-	-	-	-	-

1. Slots one through six are 64 bits wide configured on three buses with two slots each, supporting either one 133MHz or two 100MHz adapters in each bus. The slots are backward compatible for adapters that operate at 33 or 66MHz, which reduce the buses in which they are installed to the frequency of the slowest adapter.

2. All six slots are full-length Active PCI-X (hot-plug capable). For Network Operating System support, access [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat).

3. All slots support either 100MHz or 133MHz adapters (as well as 33MHz and 66MHz adapters). If an adapter rated at 133MHz is installed in either slot of any of the three buses, the other slot must remain vacant.

4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache with two internal and four external Ultra 160 connectors. External connections only can be used. External connectors are 0.8mm VHDCI.

5. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra 160 connectors. External connections only can be used. External connectors are 0.8mm VHDCI.

6. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and one internal and one external Ultra 160 connector. External connection only can be used. External connector is 0.8mm VHDCI.

7. PCI Wide Ultra 160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. External connection only can be utilized.

8. See Fibre Channel Solutions Overview section for additional configuration information.

9. The 2108R3L SAN Data Gateway Router Ultra SCSI LVD port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).

10. Installs into the RXE-100 to expand slot availability from six to 12. The expansion enclosure must be powered down to install this option. Cables internally through the secondary RIO connectors. The additional six slots are numbered one to six with the same attributes as the standard unit.

11. Allows the x360 remote management functionality to support the RXE-100. A 3.5m cable is standard for installations in the same rack. The 8m length is required when installing in a different rack.

12. Primary expansion cable connecting the expansion enclosure PCI slot capability to the system processor and memory components. A 3.5m cable is standard for installations in the same rack. The 8m length is required when installing in a different rack. Connects the RIO port on the back of the system to the primary RIO port on the back of the enclosure.

13. Ships standard with the RXE-100 Remote Expansion Enclosure.

14. Install only in even-numbered slots.



Bus 3: PCIX Slot 1, 3.3V
Bus 3: PCIX Slot 2, 3.3V
Bus 2: PCIX Slot 3, 3.3V
Bus 2: PCIX Slot 4, 3.3V
Bus 1: PCIX Slot 5, 3.3V
Bus 1: PCIX Slot 6, 3.3V

All slots are 64-bit, full-length, 133MHz Active PCI-X. Each bus supports only one 133MHz adapter. If two 133MHz adapters are installed, both will operate at 100MHz. If a lower frequency adapter is installed, the bus will operate at that frequency.

Scan sequence: slots 11, 12, 9, 10, 7, 8, 17, 18, 15, 16, 13, 14.

### RXE-100 Remote Expansion Enclosure Power

Part Number	Description
<b>Power<sup>1</sup></b>	
31P6108	370W Hot-Swap Redundant Power Supply
<b>Uninterruptible Power Supply (UPS)<sup>2</sup></b>	
32P1020	APC 2U Smart-UPS 1400RMB
2130R30	UPS3000XLV <sup>3</sup>
2130R31	UPS3000XHv <sup>3</sup>
32P1692	UPS Extend Run Battery Pack <sup>3</sup>
37L6861	APC Smart-UPS 5000RMB <sup>4</sup>

1. RXE-100 includes two 370W hot-swap power supplies, each with two 9ft power cords--one high voltage IEC 320-C13 to IEC 320-C14 and one low voltage IEC 320-C13 to NEMA 5-15P. N+1 power supply redundancy is standard for full configurations. A third power supply is not supported.

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

3. Height is 2U. See Rack Cabinets and Options section for supported IBM racks.

4. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.



**RXE-100 Remote Expansion Enclosure Tape Options**

Part Number	Tape Drives	Bays Supported <sup>1</sup>	SCSI Interface (bit)	Form Factor	Termination Included	Ext Tape Enclosures
00N8016	100/200GB LTO Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	γ <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	-	16 Ultra2 LVD	133mm (5.25in) FH	γ <sup>2</sup>	3551001 <sup>3</sup> 3503B1X
24P2396	100/200GB LTO Half-High Tape Drive <sup>7</sup>	-	16 Ultra2 LVD	133mm (5.25in) HH	γ <sup>2</sup>	3551001 <sup>3</sup>
<b>External Tape Libraries<sup>4</sup></b>						
3570C2x	Magstar MP 3570 Tape Subsystem	-	HVD	6U Rack	Y	-
<b>External Tape Enclosures</b>						
3551001	NetMEDIA Storage Expansion Unit EL <sup>5</sup>	-	16 LVD	Rack	Y	-
3503B1X	Full-High SCSI Tape Enclosure <sup>6</sup>	-	16 Ultra2 LVD	Desktop or 3U Rack	Y	-

1. RXE-100 does not support internal tape drives. An external tape library or tape enclosure must be used. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8mm VHDCI connector. Select tape drive, enclosure and controller then use Appendix D: Cables - Storage Units - Controllers to select an appropriate external cable.

2. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.

3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.

4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.

5. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included.

6. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016.

7. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.



# VMware ESX Server 1.5

Virtual machine software for consolidating and partitioning systems in high-performance environments

<b>Worldwide Part Number<sup>1</sup></b>	<b>EMEA Part Number<sup>1</sup></b>	<b>Description</b>
481712X	73P6315	VMware ESX Server 1.5 (1-2 processors)
481714X	73P6316	VMware ESX Server 1.5 (2-4 processors)
481718X	73P6317	VMware ESX Server 1.5 (5-8 processors)
481716X	73P6318	VMware ESX Server 1.5 (9-16 processors)

1. Orderable only when configured with an xSeries server, not separately.

## Server Compatibility

<b>Server</b>	<b>481712X</b>	<b>481714X</b>	<b>481718X</b>	<b>481716X</b>
xSeries 255	yes	yes	no	no
xSeries 330	yes	no	no	no
xSeries 360	yes	yes	no	no
xSeries 440	yes	yes	yes	yes

Warning: Options that are compatible with a supported system may not be supported by VMware. To confirm support of an option, review the current device list for VMware on the ServerProven Web site at [www.pc.ibm.com/us/support](http://www.pc.ibm.com/us/support).

- IBM provides support for Windows, Linux and leading applications in a VMware environment.
- Differences in system configurations are invisible to operating systems and applications.
- Clustering environments can be supported within a single server.
- Provides a cost-effective failover solution for mixed OS environments.
- Supports up to 64 1GB virtual machines in an 8U rack space (using 16-way xSeries 440).

For additional information on the Web, go to [www.pc.ibm.com/ww/eserver/xseries/vmware.html](http://www.pc.ibm.com/ww/eserver/xseries/vmware.html).



# IBM Datacenter Solution Program

The IBM Datacenter Solution Program is a comprehensive set of product and service offerings intended to deliver true enterprise computing solutions based on the Microsoft® Windows® 2000 Datacenter Server operating system. The Windows 2000 Datacenter Server product runs on the xSeries 440 rack-mounted server, which offers up to 16-way processing, up to 32GB of memory<sup>1</sup> and six PCI slots per chassis (two chassis' are required for 16-way configurations), and external Fibre Channel or SCSI storage. The Datacenter Solution can be ordered in one- and two-node configurations from the bundles shown here, and in three- and four-node configurations by ordering additional nodes. The bundles illustrated here are base configurations that can be expanded to meet your needs. The IBM Datacenter Solution includes Microsoft-certified hardware, the Windows Datacenter Server operating system preloaded, and a set of standard and optional services.

In addition to the information on the following pages, the IBM Datacenter Solution Program includes the following software and services. The services products must be ordered separately. A complete Solutions Assurance Review will be conducted by IBM or your IBM business partner to ensure that the configuration being ordered is complete.

## Software

Microsoft Windows 2000 Datacenter Server, licensed for up to 16 CPUs<sup>2</sup>  
(Client Access Licenses to be purchased separately)  
IBM Director 3.1  
IBM Director Universal Management Services  
APC UPS Software

## Standard Services

Solutions Assurance Review<sup>3</sup>  
Factory installation and software preload  
Limited Warranty<sup>4</sup> service with 24x7 same day response

## IBM Support Services

On-site installation  
Microsoft Authorized Premier Support (MAPS--base software support for Datacenter, where available)  
IBM Software Update Subscription for Microsoft Windows Datacenter (US)<sup>7</sup>  
Advanced Support for Mission Critical Systems (US)  
Support Line (base software support outside the US and where MAPS is not available)  
High Availability Services<sup>5</sup> (including up to 99.99% availability guarantee in the US)  
xSeries 99.9% High Availability Guarantee<sup>6</sup> outside the US  
Warranty upgrade (24x7x2 hour response)  
Operational Support Services, e.g., electronic system management for xSeries, account advocate  
Testing Services--proof of concept, assessment, design and planning  
Business Continuity and Recovery Services  
Custom services for unique requirements

1. Maximum memory may require replacement of standard memory with optional maximum memory module.

2. IBM makes no representations or warranties regarding non-IBM products or services. These products are offered and warranted by third parties.

3. IBM provides this service standard for all Datacenter sales direct through IBM. Business Partners will also perform this service but may choose to charge a fee.

4. For information on IBM's Statement of Limited Warranty, call 1-800-772-2227 or contact your IBM representative or reseller. Copies are available upon request. International Warranty Service available in those countries where the particular product is sold by IBM or IBM Business Partners (registration required). With respect to on-site service, IBM sends a technician after attempting to resolve the problem remotely.

5. The High Availability Services for Business Critical Systems offering for an availability guarantee is an optional service and is only offered for eligible IBM e(logo)server xSeries environments at this time. IBM reserves the right to change the terms and conditions of the program at any time, without notice. For more details, refer to [www-1.ibm.com/services/its/us/highavail2.html](http://www-1.ibm.com/services/its/us/highavail2.html).

6. The xSeries 99.9% High Availability Guarantee program is an optional offering on eligible xSeries configurations. IBM reserves the right to change the terms and conditions of the program at any time, without notice. For more details, refer to [www.pc.ibm.com/ww/eserver/xseries/999guarantee.html](http://www.pc.ibm.com/ww/eserver/xseries/999guarantee.html).

7. This annual subscription service ensures that customers receive all updates to the Microsoft Datacenter operating system (and roll up of IBM driver updates). Staying current on Datacenter patches is a requirement for Microsoft support; therefore, this service is highly recommended to all Datacenter customers.



# IBM Datacenter Solutions

## EMEA Part Number Cross Reference

IBM Datacenter Solution - Single Node				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION SERVER MODELS	EMEA WDFM DATE
K71AXxx	86871AX	8687-1AX	xSeries 440, 2xXeon MP 1.4GHz/512KB, Open, 24X	---
K72AXxx	86872AX	8687-2AX	xSeries 440, 2xXeon MP 1.5GHz/512KB, Open, 24X	---
K73AXxx	86873AX	8687-3AX	xSeries 440, 2xXeon MP 1.6GHz/1MB, Open, 24X	---
K74AXxx	86874AX	8687-4AX	xSeries 440, 2xXeon MP 1.5GHz/1MB, Open, 24X	---
K75AXxx	86875AX	8687-5AX	xSeries 440, 2xXeon MP 1.9GHz/1MB, Open, 24X	---
K77AXxx	86877AX	8687-7AX	xSeries 440, 2xXeon MP 2.0GHz/2MB, Open, 24X	---

Note 1

IBM Datacenter Solution - Single Node				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION SOFTWARE	EMEA WDFM DATE
02R26xx	48161BU	4816-1BX	Preload Kit For Microsoft Windows 2000 Datacenter, 1-8 Processors	---

1. Where 'xx' represents a language: 96=English, 97=French, 81=German, 98=Spanish

IBM Datacenter Solution - Two Node				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION SERVER MODELS	EMEA WDFM DATE
K71AXxx	86871AX	8687-1AX	xSeries 440, 2xXeon MP 1.4GHz/512KB, Open, 24X	---
K72AXxx	86872AX	8687-2AX	xSeries 440, 2xXeon MP 1.5GHz/512KB, Open, 24X	---
K73AXxx	86873AX	8687-3AX	xSeries 440, 2xXeon MP 1.6GHz/1MB, Open, 24X	---
K74AXxx	86874AX	8687-4AX	xSeries 440, 2xXeon MP 1.5GHz/1MB, Open, 24X	---
K75AXxx	86875AX	8687-5AX	xSeries 440, 2xXeon MP 1.9GHz/1MB, Open, 24X	---
K77AXxx	86877AX	8687-7AX	xSeries 440, 2xXeon MP 2.0GHz/2MB, Open, 24X	---

Note 2

IBM Datacenter Solution - Two Node				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION SOFTWARE	EMEA WDFM DATE
02R26xx	48161BU	4816-1BX	Preload Kit For Microsoft Windows 2000 Datacenter, 1-8 Processors	---

2. Where 'xx' represents a language: 96=English, 97=French, 81=German, 98=Spanish

IBM Datacenter Solution - 16-way				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION SERVER MODELS	EMEA WDFM DATE
K718Xxx	868718X	8687-18X	xSeries 440, 8xXeon MP 1.4GHz/512KB, Open, 24X	---
K728Xxx	868728X	8687-28X	xSeries 440, 8xXeon MP 1.5GHz/512KB, Open, 24X	---
K738Xxx	868738X	8687-38X	xSeries 440, 8xXeon MP 1.6GHz/1MB, Open, 24X	---
K748Xxx	868748X	8687-48X	xSeries 440, 8xXeon MP 1.5GHz/1MB, Open, 24X	---
K758Xxx	868758X	8687-58X	xSeries 440, 8xXeon MP 1.9GHz/1MB, Open, 24X	---
K778Xxx	868778X	8687-78X	xSeries 440, 8xXeon MP 2.0GHz/1MB, Open, 24X	---

Note 3

IBM Datacenter Solution - 16-way				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION SOFTWARE	EMEA WDFM DATE
02Rxxxx	48161DU	4816-1DX	Preload Kit For Microsoft Windows 2000 Datacenter, 1-16 Processors	---

1. Where 'xxxx' represents a language: 3200=English, 3201=French, 2686=German, 3202=Spanish



# IBM Datacenter Solutions

## EMEA Part Number Cross Reference

IBM Datacenter Solution - Required Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION STORAGE SUBSYSTEMS	EMEA WDFM DATE	
Notes 4&5	24P09xx	17421RU	---	FAST700 Storage Server	---
Notes 4&6	24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---

4. This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
5. Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.
6. Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.

IBM Datacenter Solution - Required Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION RACK AND RELATED COMPONENTS	EMEA WDFM DATE	
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US ke	N/A
	32P1703	32P1703	---	NetBAY 2U Flat Panel Monitor Console Kit (without ke	---
Note 7	28L36xx	28L3644	---	Spacesaver II Keyboard	---
	94G7448	94G6667	---	Rack Power Cord	---

7. Where 'xx' represents a specific country code as follows:- 46=Danish, 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

IBM Datacenter Solution - Selectable Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION EXTERNAL FIBRE STORAGE	EMEA WDFM DATE	
Notes 8&9	24P09xx	17421RU	---	FAST700 Storage Server	---
Notes 8&10	00N71xx	35601RU	---	FAST EXP500 Storage Expansion Unit	---
Notes 8&11	24P09xx	17401RU	---	FAST EXP700 Storage Expansion Unit	---

8. This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.
9. Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.
10. Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.
11. Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.

IBM Datacenter Solution - Selectable Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION RACK-RELATED	EMEA WDFM DATE	
Note 12	37L68xx	37L6866	---	NetBAY Rack PDU	---
Note 13	32P1681	2130R30	---	UPS3000XLV	---
Note 14	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---
Note 15	21P99xx	4560SLX	---	SDLT/LTO Modular Tape Library	---

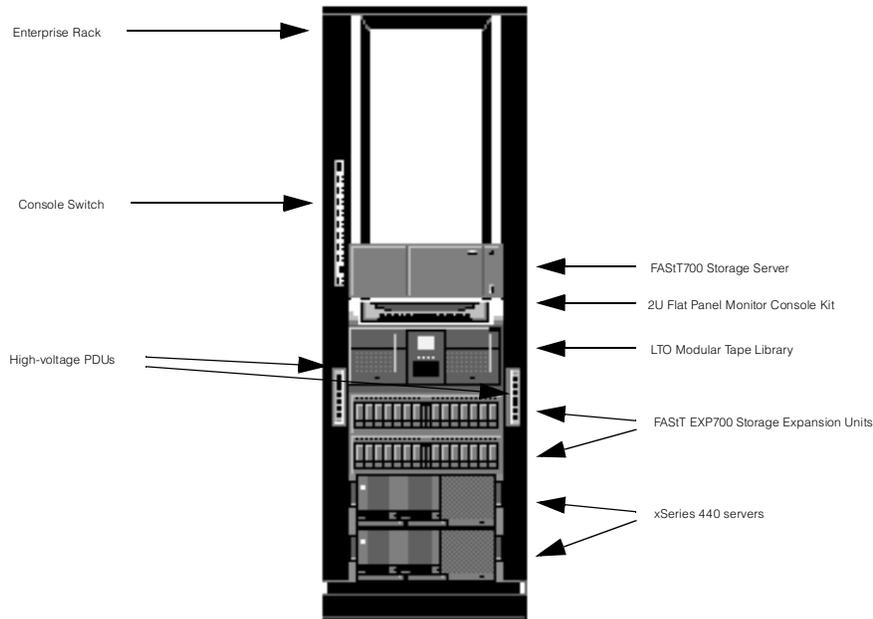
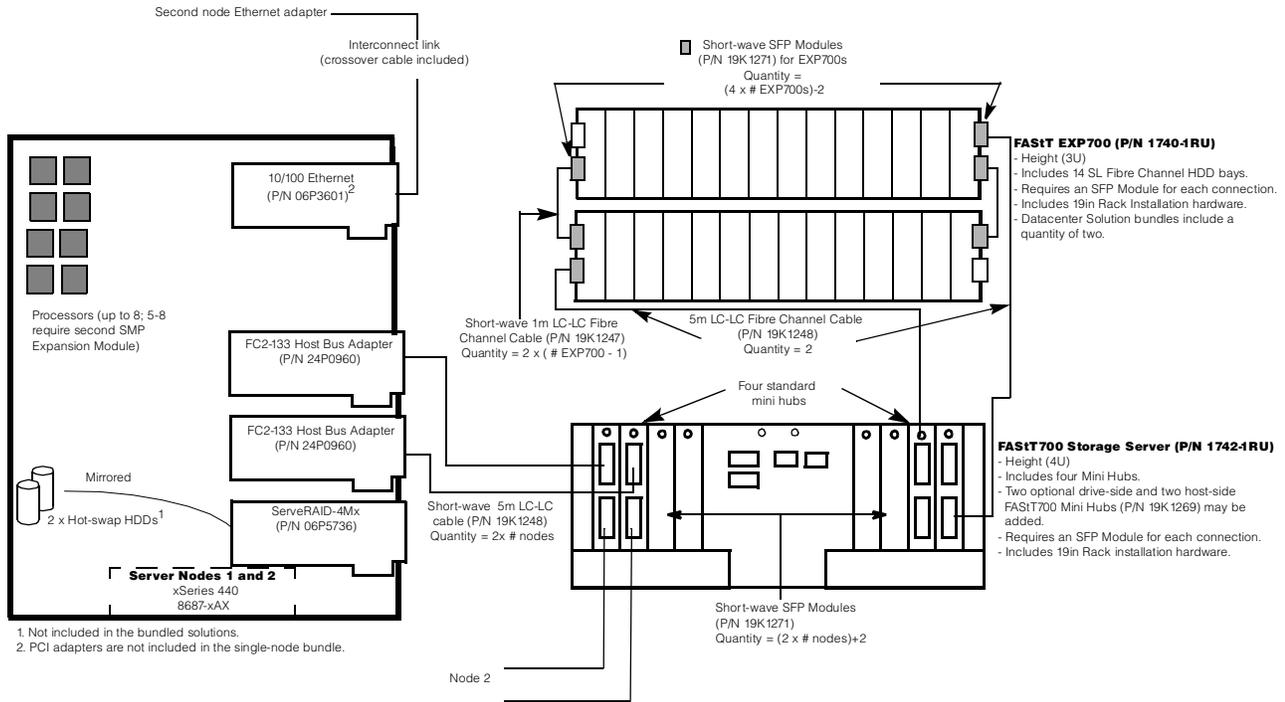
12. Where 'xx' represents a specific country code as follows: 66=US/Saudi Arabia, 68=EU, 70=Denmark/Switzerland, 72=Israel, 74=Italy, 76=South Africa, P/N 06P6028=UK.
13. Only available in Saudi Arabia.
14. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.
15. Where 'xx' represents a country specific power cord code: 72=UK, 73=EU1, 74=Denmark, 75=India/South Africa, 76=Swiss, 77=Italy, 78=Israel.

IBM Datacenter Solution - Selectable Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION FEES	EMEA WDFM DATE	
	4816ABX	4816ABX	---	Software Update Subscription for Microsoft Windows Datacenter, 1-8 Processors	---
	02R2658	4816ADX	---	Software Update Subscription for Microsoft Windows Datacenter, 1-16 Processors	---



# Datacenter Solutions

The product content described here is consistent worldwide; however, there may be some variance in IBM part numbers outside of the US and Canada. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.





IBM Datacenter Solution - Single Node						
Bundle Components	IBM Datacenter Solution - Single Node includes the part numbers and quantities identified in this table. Required options must be purchased separately and are identified in the table labeled "Required Options." Additional options for IBM Datacenter Solutions are listed in the table labeled "Selectable Options." All final customer configurations and solutions require IBM Solution Assurance Approval.				Limited Warranty Service 24x7x4 hrs	Limited Warranty Service 24x7x2 hrs <sup>1</sup>
Part Number	Description	Qty	Usage	Part Number	Part Number	
<b>Standalone</b>			Use for adding one or two nodes to a two-node cluster.			
<b>Select from six server models:</b>						
8687-1AX	xSeries 440 2x1.4GHz/512KB Xeon MP, open, 24X	-	-	N/A	N/A	
8687-2AX	xSeries 440 2x1.5GHz/512KB Xeon MP, open, 24X	-	-	N/A	N/A	
8687-3AX	xSeries 440 2x1.6GHz/1MB Xeon MP, open, 24X	-	-	N/A	N/A	
8687-4AX	xSeries 440 2x1.5GHz/1MB Xeon MP, open, 24x	-	-	N/A	N/A	
8687-5AX	xSeries 440 2x1.9GHz/1MB Xeon MP, open, 24x	-	-	N/A	N/A	
8687-7AX	xSeries 440 2x2GHz/2MB Xeon MP, open, 24x	-	-	N/A	N/A	
<b>Select from six processor upgrades:<sup>2</sup></b>		<b>Processor upgrades must match standard processor.</b>				
32P8705	1.4GHz/400MHz-512KB L3 Cache with Xeon Processor MP	2 or 6	Compatible only with 8687-1AX.	N/A	N/A	
32P8706	1.5GHz/400MHz-512KB L3 Cache with Xeon Processor MP	2 or 6	Compatible only with 8687-2AX.	N/A	N/A	
32P8707	1.6GHz/400MHz-1MB L3 Cache with Xeon Processor MP	2 or 6	Compatible only with 8687-3AX.	N/A	N/A	
59P5171	1.5GHz/400MHz-1MB L3 Cache with Xeon Processor MP	2 or 6	Compatible only with 8687-4AX.	N/A	N/A	
59P5172	1.9GHz/400MHz-1MB L3 Cache with Xeon Processor MP	2 or 6	Compatible only with 8687-5AX.	N/A	N/A	
59P5173	2GHz/400MHz-2MB L3 Cache with Xeon Processor MP	2 or 6	Compatible only with 8687-7AX.	N/A	N/A	
59P5188	SMP Expansion Module	1	Required when upgrading from 4-way to 8-way node <sup>3</sup> .	N/A	N/A	
<b>Controllers</b>						
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller	1	Supports NOS mirroring on internal HDDs.	N/A	N/A	
24P0960	FC2-133 Host Bus Adapter	2	Redundant paths to external storage subsystems (Fibre Channel storage only).	N/A	N/A	
06P3601	10/100 Ethernet Server Adapter	1	Node-to-node interconnect (required only with multiple-node cluster).	N/A	N/A	
<b>Software</b>						
4816-1BU	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 Processors	1	-	N/A	N/A	
4816-1BF	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 Processors (French)	1	-	N/A	N/A	
4816-1BS	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 Processors (Spanish)	1	-	N/A	N/A	
<b>Services</b>						
06P7505	Image Load Fee	1	-	N/A	N/A	
06P7496	Option Install Fee for first option	1	-	N/A	N/A	

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).

2. MHz/GHz only measure microprocessor internal clock speed; many factors affect application performance.

3. Refer to xSeries 440 Processors and I/O Options sections for details on SMP expansion cabling.



## IBM Datacenter Solution - Two Node

Bundle Components	IBM Datacenter Solution - Two Node includes the part numbers and quantities identified in this table. Required options must be purchased separately and are identified in the table labeled "Required Options." Additional options for IBM Datacenter Solutions are listed in the table labeled "Selectable Options." All final customer configurations and solutions require IBM Solution Assurance Approval.				Limited Warranty Service 24x7x4 hrs	Limited Warranty Service 24x7x2 hrs <sup>1</sup>
Part Number	Description	Qty/ Node	Total Qty	Usage	Part Number	Part Number
<b>Server Nodes 1 and 2</b>						
<b>Select from six server models:</b>						
8687-1AX	xSeries 440 2x1.4GHz/512KB Xeon MP, open, 24X	-	2	-	N/A	N/A
8687-2AX	xSeries 440 2x1.5GHz/512KB Xeon MP, open, 24X	-	2	-	N/A	N/A
8687-3AX	xSeries 440 2x1.6GHz/1MB Xeon MP, open, 24X	-	2	-	N/A	N/A
8687-4AX	xSeries 440 2x1.5GHz/1MB Xeon MP, open, 24x	-	2	-	N/A	N/A
8687-5AX	xSeries 440 2x1.9GHz/1MB Xeon MP, open, 24x	-	2	-	N/A	N/A
8687-7AX	xSeries 440 2x2GHz/2MB Xeon MP, open, 24x	-	2	-	N/A	N/A
<b>Select from six processor upgrades: Processor upgrades must match standard processor.</b>						
32P8705	1.4GHz/400MHz-512KB L3 Cache with Xeon Processor MP	2 or 6	4 or 12	Compatible only with 8687-1AX.	N/A	N/A
32P8706	1.5GHz/400MHz-512KB L3 Cache with Xeon Processor MP	2 or 6	4 or 12	Compatible only with 8687-2AX.	N/A	N/A
32P8707	1.6GHz/400MHz-1MB L3 Cache with Xeon Processor MP	2 or 6	4 or 12	Compatible only with 8687-3AX.	N/A	N/A
59P5171	1.4GHz/400MHz-1MB L3 Cache with Xeon Processor MP	2 or 6	4 or 12	Compatible only with 8687-4AX.	N/A	N/A
59P5172	1.9GHz/400MHz-1MB L3 Cache with Xeon Processor MP	2 or 6	4 or 12	Compatible only with 8687-5AX.	N/A	N/A
59P5173	2GHz/400MHz-2MB L3 Cache with Xeon Processor MP	2 or 6	4 or 12	Compatible only with 8687-7AX.	N/A	N/A
59P5188	SMP Expansion Module	1	2	Required when upgrading from 4-way to 8-way node <sup>2</sup> .	N/A	N/A
<b>Controllers</b>						
06P5736	ServeRAID-4Mx Ultra 160 SCSI Controller	1	2	Supports NOS mirroring on internal HDDs.	N/A	N/A
24P0960	FC2-133 Host Bus Adapter	2	4	Redundant paths to external storage subsystems.	N/A	N/A
06P3601	10/100 Ethernet Server Adapter	1	2	Node to node interconnect.	N/A	N/A
<b>Software</b>						
4816-1BU	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 processors	1	2	-	N/A	N/A
4816-1BF	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 Processors (French)	1	2	-	N/A	N/A
4816-1BS	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 Processors (Spanish)	1	2	-	N/A	N/A
<b>Services</b>						
06P7505	Image Load Fee	1	2	-	N/A	N/A
06P7556	Enterprise Rack Prep Fee	-	1	Quantity equals the number of racks.	N/A	N/A
06P7515	Enterprise Rack Installation Fee	-	5	Quantity equals the number of major rack components installed.	N/A	N/A
06P7496	Option Install Fee for first option	1	2	-	N/A	N/A

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).  
 2. Refer to xSeries 440 Processors and I/O Options sections for details on SMP expansion cabling.



<b>IBM Datacenter Solution - 16-way</b>						
<b>Bundle Components</b>	IBM Datacenter Solution - 16-way includes the part numbers and quantities identified in this table. Required options must be purchased separately and are identified in the table labeled "Required Options." Additional options for IBM Datacenter Solutions are listed in the table labeled "Selectable Options." All final customer configurations and solutions require IBM Solution Assurance Approval.				<b>Limited Warranty Service 24x7x4 hrs</b>	<b>Limited Warranty Service 24x7x2 hrs<sup>1</sup></b>
<b>Part Number</b>	<b>Description</b>	<b>Qty/ chassis</b>	<b>Total Qty</b>	<b>Usage</b>	<b>Part Number</b>	<b>Part Number</b>
<b>16-way server chassis<sup>1</sup></b>						
<b>Select from three server models:</b>						
8687-18X	xSeries 440 8x1.4GHz/400MHz-512KB Xeon MP, open, 24x	2	2	-	N/A	N/A
8687-28X	xSeries 440 8x1.5GHz/400MHz-512KB Xeon MP, open, 24x	2	2	-	N/A	N/A
8687-38X	xSeries 440 8x1.6GHz/400MHz-1MB Xeon MP, open, 24x	2	2	-	N/A	N/A
8687-48X	xSeries 440 8x1.5GHz/400MHz-1MB Xeon MP, open, 24x	2	2	-	N/A	N/A
8687-58X	xSeries 440 8x1.9GHz/400MHz-1MB Xeon MP, open, 24x	2	2	-	N/A	N/A
8687-78X	xSeries 440 8x2GHz/400MHz-2MB Xeon MP, open, 24x	2	2	-	N/A	N/A
<b>Controllers</b>						
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller	1	-	Supports NOS mirroring on internal HDDs.	N/A	N/A
24P0960	FC2-133 Host Bus Adapter	2	-	Redundant paths to external storage subsystems.	N/A	N/A
<b>Software</b>						
4816-1DU	Preload Kit for Microsoft Windows 2000 Datacenter, 1-16 processors	1	-	-	N/A	N/A
4816-1DF	Preload Kit for Microsoft Windows 2000 Datacenter, 1-16 processors (French)	1	-	-	N/A	N/A
4816-1DS	Preload Kit for Microsoft Windows 2000 Datacenter, 1-16 processors (Spanish)	1	-	-	N/A	N/A
<b>Services</b>						
06P7505	Image Load Fee	1	2	-	N/A	N/A
06P7496	Option Install Fee for first option	1	2	-	N/A	N/A

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).



## IBM Datacenter Solution - Required Options

Required Options	Required Options provide alternative methods of meeting minimum memory and storage requirements. Customer requirements will vary; therefore, these options are configured and purchased separate from the base solution bundle. All final customer configurations and solutions require IBM Solution Assurance Approval.			Limited Warranty Service 24x7x4 hrs	Limited Warranty Service 24x7x2 hrs <sup>1</sup>
Part Number	Description	Qty/Node	Usage	Part Number	Part Number
<b>Install a minimum of four RDIMMs per SMP Expansion Module in each node</b>			Four RDIMMs must be installed in each SMP Expansion Module in each node. A maximum of 16 RDIMMs can be installed in each SMP Expansion Module (32 total per node)		
33L3324	512MB PC133 ECC SDRAM RDIMM	4+4N	RDIMMs must be added in matched groups of four.	N/A	N/A
31P8300	1GB PC133 ECC SDRAM RDIMM	4+4N	RDIMMs must be added in matched groups of four.	N/A	N/A
<b>Install two internal HDD options per node</b>			Two HDDs must be installed in each node.		
06P5755	36.4GB <sup>2</sup> 10Krpm Ultra160 SCSI Hot-swap SL HDD	2	Internal HDDs for NOS installation.	N/A	N/A
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	2	Internal HDDs for NOS installation.	N/A	N/A
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	2	Internal HDDs for NOS installation.	N/A	N/A
<b>Interconnect cable</b>		<b>Qty</b>			
19K5788	25ft Ethernet crossover cable	1	Interconnects 2 nodes without an Ethernet switch. Not required in 16-way configuration.	N/A	N/A
<b>Storage Subsystems</b>		<b>Qty</b>			
17421RU	FAST700 Fibre Channel Storage Server	1	-	41L2768	41L2769
17401RU	FAST EXP700 Storage Expansion Unit	2	-	41L2766	41L2767
<b>Select F/C HDD options (multiple of two) per bundle</b>		<b>Qty</b>	A minimum of 2 HDDs must be installed, one in each FAST EXP700 Storage Expansion Unit. Additional HDDs must be installed in multiples of 2		
06P5761	2Gbps FC 36.4GB/10K drive	2-28	Install in FAST EXP700s.	N/A	N/A
06P5762	2Gbps FC 73.4GB/10K drive	2-28	Install in FAST EXP700s.	N/A	N/A
06P5771	2Gbps FC 18.2GB/15K drive	2-28	Install in FAST EXP700s.	N/A	N/A
06P5772	2Gbps FC 36.4GB/15K drive	2-28	Install in FAST EXP700s.	N/A	N/A
<b>Storage Cables</b>		<b>Qty</b>	Calculations assume no switches are installed.		
19K1248	5m LC-LC Fibre Channel Cable	6	Redundant paths: nodes - storage server - FAST EXP700	N/A	N/A
19K1271	Short-wave SFP Module	12	Redundant paths: (2 x # EXP700s) + 2	N/A	N/A
<b>Rack and Related Components</b>		<b>Qty</b>			
32P1702	NetBAY 2U Flat Panel Monitor Kit (with US Space Saver keyboard)	1	-	30L9183	N/A
930842S	NetBAY42 Enterprise Rack Cabinet (ER)	1	-	41L2762	41L2763
94G6670	Blank Filler Panel Kit	2	Fills empty front panel space to control air flow.	N/A	N/A
09N4290	NetBAY 1x4 Console Switch	1	Attaches up to 4 nodes to a single monitor, keyboard and mouse.	N/A	N/A
94G7447	NetBAY Console Cable Set 12ft (3.66m)	2	Attaches each node to a Console Server Selector Switch.	N/A	N/A
94G7448	Power Cable Type C12 (3.7m, 12ft)	7	Provides IEC 320-C13 (Device) to IEC320-C14 (Power Unit) power cord.	N/A	N/A
<b>Services</b>		<b>Qty</b>			
25P4142	Option Install Fee	as required	Quantity equals the number of options installed less one (per node).	N/A	N/A
<b>Select one of the two warranty services per bundle</b>					
24x7x4 option	Use the above applicable part numbers with the correct quantity.		-	N/A	N/A
24x7x2 option	Use the above applicable part numbers with the correct quantity.		-	N/A	N/A

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).

All final customer configurations and solutions require IBM Solution Assurance Approval.

2. GB equals one billion bytes. When referring to internal storage capacity, total user-accessible capacity may be less.



<b>IBM Datacenter Solution - Selectable Options</b>						
<b>Selectable Options</b>	Selectable options are not required but are compatible for use with IBM Datacenter bundles. All final customer configurations and solutions require IBM Solution Assurance Approval.			<b>Limited Warranty Service 24x7x4 hrs</b>	<b>Limited Warranty Service 24x7x2 hrs<sup>1</sup></b>	<b>Enterprise Rack Assembly Fee</b>
<b>Part Number</b>	<b>Description</b>	<b>Usage</b>	<b>Part Number</b>	<b>Part Number</b>	<b>Part Number</b>	
<b>Additional node:</b>						
	Datacenter additional node (see single node offering for configuration options and rules)	Preloaded xSeries 440 1AX, 2AX, 3AX, 4AX, 5AX or 7AX for nodes 3 and 4.	N/A	N/A	N/A	
4816-1BU	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 processors	-	N/A	N/A	N/A	
4816-1BF	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 processors (French)	-	N/A	N/A	N/A	
4816-1BS	Preload Kit for Microsoft Windows 2000 Datacenter, 1-8 processors (Spanish)	-	N/A	N/A	N/A	
4816-1DU	Preload Kit for Microsoft Windows 2000 Datacenter, 1-16 processors	-	N/A	N/A	N/A	
4816-1DF	Preload Kit for Microsoft Windows 2000 Datacenter, 1-16 processors (French)	-	N/A	N/A	N/A	
4816-1DS	Preload Kit for Microsoft Windows 2000 Datacenter, 1-16 processors (Spanish)	-	N/A	N/A	N/A	
<b>Processor upgrades<sup>2</sup>:</b>						
32P8705	1.4GHz/400MHz-512KB L3 Cache with Xeon Processor MP	Two, four or eight processors supported.				
32P8706	1.5GHz/400MHz-512KB L3 Cache with Xeon Processor MP	Two, four or eight processors supported.	N/A	N/A	N/A	
32P8707	1.6GHz/400MHz-1MB L3 Cache with Xeon Processor MP	Two, four or eight processors supported.	N/A	N/A	N/A	
59P5171	1.5GHz/400MHz-1MB L3 Cache with Xeon Processor MP	Two, four or eight processors supported.	N/A	N/A	N/A	
59P5172	1.9GHz/400MHz-1MB L3 Cache with Xeon Processor MP	Two, four or eight processors supported.	N/A	N/A	N/A	
59P5173	2GHz/400MHz-2MB L3 Cache with Xeon Processor MP	Two, four or eight processors supported.	N/A	N/A	N/A	
<b>4-way to 8-way upgrade kits:</b>						
59P5188	SMP Expansion Module	Required when upgrading from 4-way to 8-way node. Requires installation of four processors (fully populated). <sup>3</sup>	N/A	N/A	N/A	
<b>4-way and 8-way to 16-way upgrade kits:</b>						
73P8734	4-way to 16-way Enablement Kit	Required when upgrading 4-way systems to 16-way.	N/A	N/A	N/A	
73P8735	8-way to 16-way Enablement Kit	Required when upgrading 8-way systems to 16-way.	N/A	N/A	N/A	
<b>External Fibre Channel storage:</b>						
24P0960	FC2-133 Host Bus Adapter	-	N/A	N/A	N/A	
17421RU	FASTT700 Fibre Channel Storage Server	-	41L2768	41L2769	21P3342	
35601RU	FASTT EXP500 Storage Expansion Unit	-	41L2766	41L2767	21P3342	
17401RU	FASTT EXP700 Storage Expansion Unit	-	41L2766	41L2767	21P3342	
<b>Cables, connectors and switches:</b>						
36L9973	Netfinity Fibre Channel 1m Cable	1Gb Fibre Channel cable used to daisy-chain EXP500s.	N/A	N/A	N/A	
03K9308	Netfinity Fibre Channel Short-wave GBIC	1Gb GBIC used in EXP500 connections.				
19K1250	LC-SC Fibre Channel Adapter Cable	Converts signal for connections between 1Gb and 2Gb Fibre cable and components.	N/A	N/A	N/A	
19K1247	1m LC-LC Fibre Channel Cable	2Gb Fibre Channel	N/A	N/A	N/A	
19K1248	5m LC-LC Fibre Channel Cable	2Gb Fibre Channel	N/A	N/A	N/A	
19K1249	25m LC-LC Fibre Channel Cable	2Gb Fibre Channel	N/A	N/A	N/A	
19K1271	Short-wave SFP Module	2Gb Fibre Channel	N/A	N/A	N/A	
2109F16	SAN Fibre Channel Switch, 16-port	2Gb Fibre Channel	Standard	N/A	21P3342	
18P3576	Additional Power Supply for 2109F16	-	N/A	N/A	N/A	
3534F08	TotalStorage SAN Switch F08 - 8-port	2Gb Fibre Channel	N/A	N/A	N/A	
<b>I/O-related:</b>						
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller	-	N/A	N/A	N/A	
06P3601	10/100 Ethernet Server Adapter	-	N/A	N/A	N/A	
31P6301	NetXtreme 1000 T Ethernet Adapter (copper)	-	N/A	N/A	N/A	
31L3820	Fast Ethernet on STP Adapter 2.5m Cable	Attachment from Ethernet adapter to Ethernet switch.	N/A	N/A	N/A	



8684-1RX	RXE-100 Remote Expansion Enclosure	-	N/A	N/A	N/A
<b>Rack-related:</b>					
930842S	NetBAY42 Enterprise Rack Cabinet (ER)	-	41L2762	41L2763	21P3341
930842E	NetBAY42 Enterprise Expansion Rack Cabinet (EX)	-	41L2762	41L2763	21P3341
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without keyboard)	-	N/A	N/A	N/A
28L3647	NetBAY 2U Flat Panel Monitor Console Kit for French (without keyboard)	-	N/A	N/A	N/A
28L3650	NetBAY 2U Flat Panel Monitor Console Kit for Spanish (without keyboard)	-	N/A	N/A	N/A
09N4290	NetBAY 1x4 Console Switch	-	N/A	N/A	N/A
94G7447	NetBAY Console Cable Set 12ft (3.66m)	-	N/A	N/A	N/A
37L6886	NetBAY Three-phase Front-end PDU (US)	-	N/A	N/A	N/A
37L6887	NetBAY Three-phase Front-end Power Distribution Unit (IEC 309 Type 3P+N+GND)	-	N/A	N/A	N/A
37L6865	NetBAY Server Dual-cord PDU (US)	-	N/A	N/A	N/A
37L6883	NetBAY Server Dual-cord PDU (without line cord)	-	N/A	N/A	N/A
73P5790	NetBAY 200-240v Single-phase 60a Front-end PDU (US)	-	N/A	N/A	N/A
73P5789	NetBAY 200-240v Single-phase 60a Front-end PDU (International)	-	N/A	N/A	N/A
37L6866	NetBAY Rack Power Distribution Unit	-	N/A	N/A	N/A
94G6666	100-120v Power Distribution Unit	-	N/A	N/A	N/A
37L6861	APC Smart-UPS 5000RMB	-	N/A	N/A	21P3342
06P3882 <sup>4</sup>	Cisco CAT2912 12-port Ethernet Switch/Enterprise Edition	Used for heartbeat interconnect.	N/A	N/A	21P3342
19K5788 <sup>4</sup>	25ft Ethernet Crossover Cable	Interconnects two nodes without an Ethernet switch.	N/A	N/A	N/A
4560SLX <sup>5</sup>	SDLT/LTO Modular Tape Library (5U rack)	Base chassis into which options are installed.	N/A	N/A	N/A
59P6657	Modular Fibre Channel Option	Router to convert Fibre Channel signal to SCSI.	N/A	N/A	N/A
59P6658	Modular LTO Drive Upgrade Option	Required to operate tape library.	N/A	N/A	N/A
59P6659	Modular LTO Cartridge Magazine Option	Installs in front bay. Holds tape media cartridges.	N/A	N/A	N/A
59P6662	Modular Elevator Link Option	Used to connect second stacked tape library.	N/A	N/A	N/A
59P6663	Modular Elevator Link Extension Option	Used for additional stacked tape libraries (up to eight per stack).	N/A	N/A	N/A
08L9120	LTO Data Cartridge	Installs in Cartridge Magazine option.	N/A	N/A	N/A
<b>Fees:</b>					
25P4142	Option Install Fee (as required)	Quantity equals the number of options installed less one (per node).	N/A	N/A	N/A
4816-ABX <sup>6</sup>	Software Update Subscription for Microsoft Windows Datacenter, 1-8 processors	-	N/A	N/A	N/A
4816-ADX <sup>6</sup>	Software Update Subscription for Microsoft Windows Datacenter, 1-16 processors	-	N/A	N/A	N/A

- This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX). All final customer configurations and solutions require IBM Solution Assurance Approval.
- Processor upgrade speed and cache must match the standard processor installed in each node.
- Refer to xSeries 440 Processors and I/O Options sections for details on SMP expansion cabling.
- There may be some variance in IBM part numbers outside of the US and Canada.
- LTO tape libraries are not certified but will be supported in Datacenter configurations, subject to Solutions Assurance approval. SDLT components are not supported for Datacenter solutions.
- This annual subscription service ensures that customers receive all updates to the Microsoft Datacenter operating system (and roll up of IBM driver updates). Staying current on Datacenter patches is a requirement for Microsoft support; therefore, this service is highly recommended to all Datacenter customers.



# BladeCenter

## EMEA Part Number Cross Reference

**Note:** This section contains all the valid part numbers for EMEA - for standard (non-CTO) ordering.

BladeCenter Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
T71XXxx	86771XX	8677-1XX	BladeCenter	---

BladeCenter Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
48P7054	48P7054	---	BladeCenter 4-port GB Ethernet switch module	---
48P7062	48P7062	---	BladeCenter 2-port Fibre Channel switch module	---
48P7052	48P7052	---	BladeCenter 1200W power supply module	---

BladeCenter Storage and Communication Expansion					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
Note 1	19K11xx	35421RU	---	FAStT 200 Storage Server	---
Note 2	19K11xx	35422RU	---	FAStT 200 HA Storage Server	---
Note 3	00N69xx	35521RU	---	FAStT500 Storage Server	---
Note 4	24P09xx	17421RU	---	FAStT700 Storage Server	---
	35L1647	35341RU	---	SAN Fibre Channel Managed Hub	---
	2108R3L	2108R3L	---	SAN Data Gateway Router UltraSCSI LVD port	---
Note 5	00N71xx	35601RU	---	FAStT EXP500 Storage Expansion Unit	---
Note 6	24P09xx	17401RU	---	FAStT EXP700 Storage Expansion Unit	---
Note 7	00N79xx	360716X	---	3607 Series 1760GB/3.5TB SDLT pro Tape Autoloader	---

1. Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..

2. Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.

3. Where 'xx' represents a specific country code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English.

4. Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.

5. Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.

6. Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.

7. Where 'xx' represents a country specific power cord code: Tower versions - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: Rack versions - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.



# BladeCenter

## EMEA Part Number Cross Reference

BladeCenter Power, Monitors, Accessories				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
	48P7052	---	BladeCenter 1200W power supply module	---
	37L6862	---	APC Smart-UPS 5000RMiB	---
Note 8	T3147xx	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 8	T3247xx	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
Note 8	T274Axx	6627-4AN	G78 17" (16" viewable image) Colour Monitor (S/Black)	---
	N/A	32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	32P1032	---	NetBAY 1U Flat Panel Monitor Console Kit (w/o keyboard)	---
	N/A	32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	N/A
	32P1703	---	NetBAY 2U Flat Panel Monitor Console Kit (w/o keyboard)	---
	1735L04	---	NetBAY Local Console Manager	---
	1735R16	---	NetBAY Remote Console Manager	---
	32P1636	---	250mm KVM Conversion Option	---
	32P1652	---	1.5M KVM Conversion Option	---
	49P2694	---	BladeCenter acoustic attenuation module	---
Note 9	28L36xx	---	Spacesaver II Keyboard	---
Note 10	31P74xx	---	Preferred Pro Full-Size Keyboard - 104 keys (S/Black)	---
	28L3675	---	Sleek 2-button Mouse (S/Black)	---

8. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

9. Where 'xx' represents a specific country code as follows:- 46=Danish, 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

10. Where 'xx' represents a specific country code as follows:- 16=Arabia, 17=Belg/Fre, 18=Belg/UK, 19=Bulgaria, 21=Czech Republic, P/N 31P8767=Czech/US, 22=Denmark, 23=Netherlands, 24=France, 27=Germany, 28=Greece, 29=Israel, 30=Hungary, 31=Iceland, 32=Italy, P/N 31P8250=Italian 141, 36=Norway, 37=Poland, 38=Portugal, 39=Romania, 40=Russia, 41=Rus/Cyrillic, 42=Serb/Cyrillic, 43=Slovak, 44=Spanish, 45=Sweden/Finland, 46=Switzerland, 48=Turkey 440, 49=Turkey 179, 50=UK English, 51=US/Euro, 52=Yugoslavia/La



# BladeCenter™

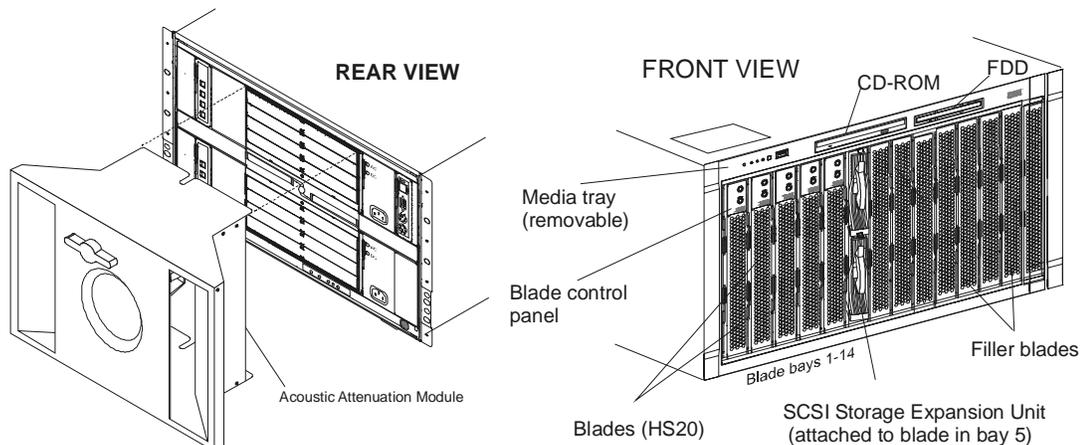
Option Part Number	Form Factor	Power Module Quantity (Std/Max)	Hot-swap (Power, Bays, Blowers)	Redundancy (Optional, Standard)	System Management Module (Std/Max)	Integrated Ethernet	Switch Module Bays (Total/Avail)	CD-ROM	Floppy Disk Drive	Blade Bays (Total/Avail)	PCI Slots / HDD Bays (Total/Avail)	SBB Number (Easy Access only) 7
8677-1XX	Rack (7U) <sup>1</sup>	2/4 <sup>2</sup>	P, B <sup>3</sup> , B	S-Blowers S-Power	1/1 <sup>4</sup>	10/100/ 1000 <sup>5</sup>	4/4	24x-10x USB	1.44MB USB	14/14	0/0 <sup>6</sup>	49P2654

**Notes:**

A fully configured eServer BladeCenter™ chassis doubles the density of 14 equally configured 1U xSeries 335 servers by accommodating up to 14 BladeCenter HS20 units installed in a 7U rack space.

BladeCenter™ increases usability and reduces complexity because it provides common sourcing for up to 14 BladeCenter HS20 units for cabling and cabling connections, I/O options, power modules, system management requirements (optional adapters and external cabling), external Fibre Channel storage switching and connectivity, and network management and expansion.

1. Housed in a 7U, 19in rack-mountable chassis (28in deep). See Rack Cabinets and Options section for supported IBM racks.
2. N+N power supply redundancy is provided standard for HS20 bays one through six and all module bays. Two 220v BladeCenter 1200w Power Modules ship installed in BladeCenter power module bays one and two. Redundant power for bays seven through 14 requires two additional power modules installed in power module bays three and four, which are both provided in optional BladeCenter 1200w Power Supply Modules (P/N 48P7052). Nonredundant power can be supplied to all 14 bays by moving power module two from the second bay to the third, which is not recommended.
3. The blade bays in the front of the chassis support hot-swapping of blade servers. A spring-action cover closes the bay opening when the blade server is removed, allowing the blade to be removed for up to two hours before thermal restrictions require replacement.
4. Comprehensive system management functionality is provided through the standard management module installed in management module bay one, which communicates with the integrated service processor on each HS20 planar. The management module also acts as a multiplexor for installed HS20 units for console connectivity (keyboard, video and mouse).
5. One of the dual integrated gigabit Ethernet controllers on each HS20 planar connects to an optional BladeCenter 4-port Gigabit Ethernet Switch Module (P/N 48P7054) installed in switch module bay one. An additional Ethernet switch module may be installed in switch module bay two, to which the second Ethernet controller integrated into each HS20 planar is connected. Ethernet capability is not provided standard in BladeCenter.
6. BladeCenter contains no PCI expansion slots or HDD bays. Internal HDD expansion is provided in the individual HS20 units. Standard I/O support includes system management, KVM (console) and Ethernet connectivity. Expanded I/O functionality is provided through optional Fibre Channel switch modules that install into the BladeCenter chassis. System management functionality is controlled by a system management module, which also installs into the rear system chassis. Expansion switch modules may not be mixed in a BladeCenter configuration because all HS20 units installed in a single BladeCenter must contain either the same kind of expansion card or no expansion card. (If an expansion card is installed, only one IDE HDD is allowed.)
7. IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.



BladeCenter



**BladeCenter™ Sales Building Blocks**

SBB Number	Option Part Number	SBB Description	Rules
<b>Selectable Hardware</b>			
<b>Select one power cord. An identical power cord will be derived in Easy Access for each power supply installed (total quantities of two or four).</b>			
24P2605	-	Rack Power Cable - 2.8m, 100-240v, C13 to IEC 320-C14 (WW)	Two cables ship with MTM. Two additional are provided with the MTM power supply option, which includes two power supplies.
32P9071	-	Rack Power Cable - 4.3m, 100-240v, C13 to IEC 320-C14 (WW)	Optional for CTO. Power cords for all power supplies must match.
32P9072	-	Line cord - 2.8m, 200-240v, C13 to NEMA 6-15P (US)	Optional for CTO. Power cords for all power supplies must match.
32P9073	-	Line cord - 1.8m, 200-240v, C13 to NEMA 6-15P (US)	Optional for CTO. Power cords for all power supplies must match.
21P9459	-	Line cord - 2.8m, 200-240v, C13 to GB 20991 (China)	Optional for CTO. Power cords for all power supplies must match.
21P9452	-	Line cord - 2.8m, 200-240v, C13 to AS/NZ 3112 (Australia/NZ)	Optional for CTO. Power cords for all power supplies must match.
21P9454	-	Line cord - 2.8m, 200-240v, C13 to CEE7-VII (European)	Optional for CTO. Power cords for all power supplies must match.
21P9456	-	Line cord - 2.8m, 200-240v, C13 to DK2-5a (Denmark)	Optional for CTO. Power cords for all power supplies must match.
21P9461	-	Line cord - 2.8m, 200-240v, C13 to SABS 164 (S Africa/India)	Optional for CTO. Power cords for all power supplies must match.
21P9455	-	Line cord - 2.8m, 200-240v, C13 to BS 1363/A (UK)	Optional for CTO. Power cords for all power supplies must match.
21P9462	-	Line cord - 2.8m, 200-240v, C13 to SEV 1011-S24507 (Swiss)	Optional for CTO. Power cords for all power supplies must match.
21P9457	-	Line cord - 2.8m, 200-240v, C13 to CEI 23-16 (Italy)	Optional for CTO. Power cords for all power supplies must match.
21P9460	-	Line cord - 2.8m, 200-240v, C13 to SI 32 (Israel)	Optional for CTO. Power cords for all power supplies must match.
21P9458	-	Line cord - 2.8m, 200-240v, C13 to IRAM 2073 (Argentina)	Optional for CTO. Power cords for all power supplies must match.
<b>Switch and Power Modules</b>			
48P7080	-	BladeCenter 1200w Power Supplies one and two	Standard with MTM, required for CTO. Provides redundant power to blade bays 1-6 and all media bays.
48P7082	48P7054	BladeCenter 4-port GB Ethernet Switch Module	Required to enable one of two integrated Ethernet controllers on the HS20 planar, installed in module bay 1. Select a second to enable the second integrated Ethernet controller, installed in module bay 2.
59P6627	48P7062	BladeCenter 2-port Fibre Channel Switch Module	Select up to two. First one installs in module bay 3, the second in module bay 4 supporting two FC controller ports on expansion card.
59P6648	48P7052	BladeCenter 1200w Power Supplies three and four	Required to provide redundant power to blade bays 7-14. Installs in bays 3 and 4. (The MTM option also includes both power supplies.)
<b>Derived Hardware</b>			
49P2654	-	Base System	BladeCenter chassis with empty blade and module bays.
48P7077	-	Blade Filler Panel	Required for each open blade bay
48P7081	48P7055	BladeCenter Redundant KVM/Management Module	Standard with MTM. Derived for CTO from base system. Provides system management connectivity for HS20s and console connectivity for keyboard, video and mouse. Includes PS/2 keyboard, PS/2 mouse and video connectors.
32P0902	-	24x Slim CD-ROM Internal IDE Drive	Standard with MTM and CTO.
48P7078	-	Switch/Management Module Filler	Required for each open module bay.
48P7079	-	Power Module Filler	Required for each open power supply bay.
<b>Publications</b>			
01R1100	-	Pubs and Software - U.S. English	Standard with MTM. Selectable for CTO.

**BladeCenter™ Storage and Communications Expansion**

Option Part Number	Description	Form Factor	SBB Number <sup>1</sup>
<b>Fibre Channel Storage Controllers</b>			
17421RU	FASiT700 Fibre Channel Storage Server	Rack (4U)	-
35521RU	FASiT500 Storage Server	Rack (4U)	-
35421RU	FASiT200 Storage Server	Rack (3U)	-
35422RU	FASiT200 HA Storage Server	Rack (3U)	-
<b>Fibre Channel Switches, Hubs and Routers</b>			
3534F08	TotalStorage SAN Switch F08 - 8-port	Rack (1U)	-
2109F16	SAN Fibre Channel Switch, 16-port	Rack (1U)	-
2108R3L	SAN Data Gateway Router UltraSCSI LVD Port <sup>2</sup>	Rack (2U)	-
<b>Fibre Channel External Storage Enclosures</b>			
17401RU	FASiT EXP700 Storage Expansion Unit	Rack (3U)	-
35601RU	FASiT EXP500 Storage Expansion Unit	Rack (3U)	-
35421RU	FASiT200 Storage Server	Rack (3U)	-
35422RU	FASiT200 HA Storage Server	Rack (3U)	-
<b>External Tape Storage</b>			
360716X	3607 Series 1760GB/3.5TB SDLTpro Tape Autoloader <sup>3</sup>	Rack (2U)	-
<b>BladeCenter Switch Modules</b>			
48P7062	BladeCenter 2-port Fibre Channel Switch Module <sup>4</sup>	-	59P6627
48P7054	BladeCenter 4-port Gigabit Ethernet Switch Module	-	48P7082
<b>Blade Server Expansion Card<sup>5</sup></b>			
48P7061	HS20 Fibre Channel Expansion Card	-	59P6613

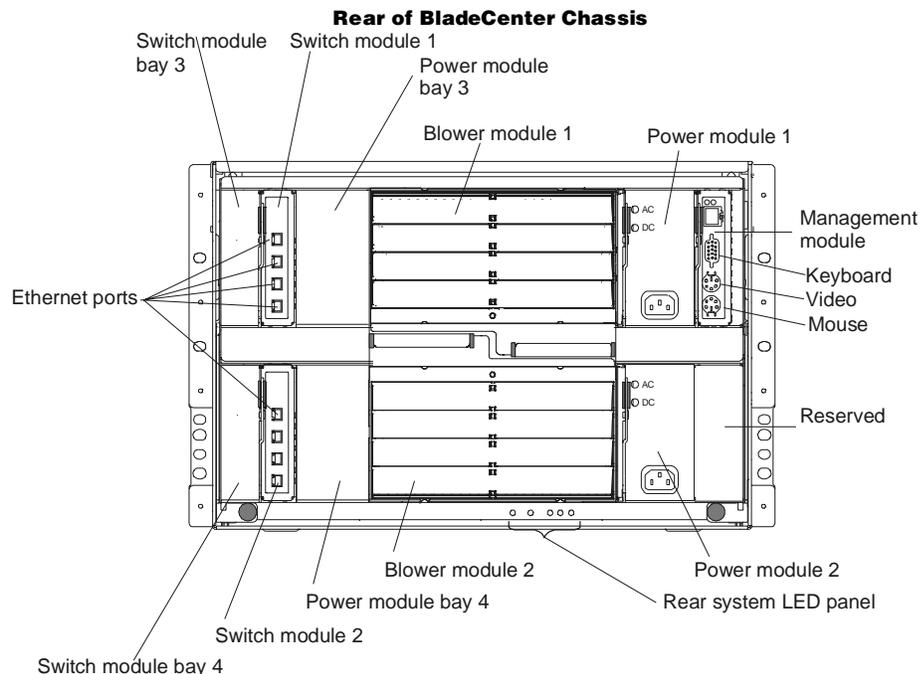
1. IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.

2. The 2108R3L SAN Data Gateway Router UltraSCSI LVD Port provides one integrated short-wave optical port (1Gb) and two SCSI ports for tape storage connections (LVD, HVD). Required for attachment of external tape storage options to the BladeCenter Fibre Channel switch module directly, through a supported switch or hub, or through a storage server.

3. Requires a SAN Data Gateway Router to attach to the external BladeCenter Fibre Channel storage configuration. Refer to Appendix A: Tape Drive Attributes or Appendix D: Cables - Storage Units - Controllers for additional information.

4. Short- or Long-wave SFP Modules (P/N 19K1271, 2) are required for each port connection.

5. Install in HS20 over IDE HDD bay two (allowing only one IDE HDD). Includes two Fibre Channel channels with two ports. One channel connects to an optional BladeCenter 2-port Fibre Channel Switch Module (48P7062) installed in switch module bay three and the second channel connects to a second optional switch module installed in switch module bay four, which provides redundancy. Compatibility with the switch module selected for installation in BladeCenter switch modules three and four is required. Expansion cards cannot be mixed within a BladeCenter chassis.





**BladeCenter™ and HS20 Power, Monitors and Accessories**

Option Part Number	Description	SBB Number <sup>8</sup>
<b>Power<sup>1</sup></b>		
48P7052	BladeCenter 1200w Power Supply Modules <sup>2</sup>	59P6648 <sup>3</sup>
<b>Uninterruptible Power Supply (UPS)<sup>3</sup></b>		
37L6861	APC Smart-UPS 5000RMB <sup>4</sup>	
<b>Monitors<sup>5</sup></b>		
633147N	E54 Color Monitor 15in (350mm, 13.8in viewable image), stealth black <sup>6</sup>	
63324HN	E74 Color Monitor 17in (406mm, 16in viewable image), stealth black <sup>6</sup>	
66274AN	G78 Color Monitor 17in (406.4mm, 16in viewable image), stealth black <sup>6</sup>	
32P1031	NetBAY 1U Flat Panel Monitor Console Kit (with US Space Saver Keyboard) <sup>7</sup>	
32P1032	NetBAY 1U Flat Panel Monitor Console Kit (without keyboard) <sup>7</sup>	
32P1702	NetBAY 2U Flat Panel Monitor Console Kit (with US Space Saver Keyboard) <sup>7</sup>	
32P1703	NetBAY 2U Flat Panel Monitor Console Kit (without Keyboard) <sup>7</sup>	

1. BladeCenter includes two 1200w hot-swap power supplies with two 2.8m/9ft IEC 320-C13 to IEC 320-C14 power cables for intrarack power distribution. Power supply redundancy is standard for blade bays one through six and all module bays. Redundancy for bays seven through 14 requires two additional power supply modules. Only high-voltage power connections are supported.
2. BladeCenter 1200w Power Supply Modules (PN 48P7052) are shipped with two power supplies and two 2.8m/9ft IEC 320-C13 to IEC 320-C14 power cables.
3. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
4. Height is 5U. See Rack Cabinets and Options section for supported IBM racks.
5. HS20 units are equipped with an integrated ATI Rage XL video controller with 8MB of video memory. Optional video adapters are not supported.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Includes a 15in Flat Panel Monitor.
8. IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.
9. CTO requires selection of power supply modules one and two, which are included standard with MTMs. SBB 48P7080 provides two 1200w hot-swap power supplies for installation in power supply bays one and two. SBB 59P6648 provides two 1200w hot-swap power supplies for installation in power supply bays three and four. Power cords are selected separately in CTO systems.

Part Number	Description	SBB Number
<b>Rack and NetBAY<sup>1</sup></b>		
	Refer to the Rack Cabinets and Options section for information concerning IBM racks and rack-supported devices.	
<b>Console Connectivity<sup>2</sup></b>		
1735L04	NetBAY Local Console Manager	-
1735R16	NetBAY Remote Console Manager	-
32P1636	250mm KVM Conversion Option	-
32P1652	1.5m KVM Conversion Option	-
<b>Acoustic Option</b>		
49P2694	BladeCenter Acoustic Attenuation Module <sup>3</sup>	-
<b>Keyboard and Mouse<sup>4</sup></b>		
28L3644	Space Saver II Keyboard <sup>5, 6</sup>	-
31P7415	Preferred Pro Full-size Keyboard - 104 Keys (stealth black) <sup>7</sup>	-
28L3673	Sleek 2-Button Stealth Black Mouse	-

1. BladeCenter is housed in a 7U, 19in rack-mountable chassis and requires one of the racks listed in the Rack Cabinets and Options section.
2. BladeCenter includes a standard management module that provides system management connectivity for all installed HS20s as well as console connectivity for keyboard, video and mouse (KVM). The management module includes one PS/2 keyboard connector, one PS/2 mouse connector, one 15-pin D-shell video connector and one RJ45 connector for a 100Mb Ethernet remote console connection to support system management functionality. Refer to the Rack Console Options section for information regarding console connectivity using these options.
3. Installs over the fan modules in the rear of the chassis to reduce decibels in sound-sensitive environments. BladeCenter generates 80 decibels (80 dBS) at maximum performance levels. The Acoustic Attenuation Module reduces the decibel level by 11 (approximately 12%).
4. BladeCenter supports rack configurations only and ships without a keyboard or mouse.
5. Installation within a rack requires optional keyboard tray (P/N 28L4707), which stows in ready-to-use position, or NetBAY 1U or 2U Flat Panel Monitor Console Kit (P/N 32P1032, 32P1702). Standard with 1U and 2U NetBAY console kits (P/N 32P1031, 32P1702).
6. Advanced TrackPoint IV features are not available.
7. Installation within a rack requires optional keyboard tray (P/N 28L4707). This keyboard cannot share a keyboard tray with a flat panel display.



## BladeCenter HS20

### EMEA Part Number Cross Reference

**Note:** This section contains all the valid part numbers for EMEA - for standard (non-CTO) ordering.

BladeCenter HS20 Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
T821Xxx	867821X	8678-21X	BladeCenter HS20	---
T841Xxx	867841X	8678-41X	BladeCenter HS20	---

BladeCenter HS20 Option Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
48P7060	48P7060	---	2.0GHz/400MHz Xeon DP Processor	---
48P7096	48P7096	---	2.4GHz/400MHz Xeon DP Processor	---
33L5037	33L5037	---	256MB PC2100 ECC DDR SDRAM RDIMM	---
33L5038	33L5038	---	512MB PC2100 ECC DDR SDRAM RDIMM	---
33L5039	33L5039	---	1GB PC2100 ECC DDR SDRAM RDIMM	---
48P7063	48P7063	---	HS20 40GB EIDE Hard Disk Drive	---
48P7058	48P7058	---	HS20 SCSI Storage Expansion Unit	---
06P5754	06P5754	---	18.2GB 10Krpm SCSI U160 HDD	---
06P5755	06P5755	---	36.4GB 10Krpm SCSI U160 HDD	---
06P5756	06P5756	---	73.4GB 10Krpm SCSI U160 HDD	---
06P5767	06P5767	---	18.2GB 15Krpm SCSI U160 HDD	---
06P5768	06P5768	---	36.4GB 15Krpm SCSI U160 HDD	---
06P5776	06P5776	---	36.4GB 15Krpm SCSI U320 HDD	---
48P7061	48P7061	---	HS20 Fibre Channel Expansion Card	---



# BladeCenter HS20

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# BladeCenter™ HS20

Option Part Number  
 Processor Speed (GHz)  
 Number of Processors (Std/Max)  
 L2 ECC Cache (KB)  
 Memory (Std/Max)  
 IDE Storage Controller  
 IDE HDD Bays (Total/Avail)  
 Internal IDE HDD Capacity (Std/Max)<sup>3</sup>  
 Onboard Ethernet (Mbps)<sup>4</sup>  
 Integrated System Management Processor<sup>5</sup>  
 Video Controller / Memory  
 SCSI Storage Expansion Processor<sup>5</sup>  
 SCSI Interface  
 SCSI Storage Expansion Unit (Std/Max)<sup>6</sup>  
 SCSI HDD Bays (Total/Avail)<sup>7</sup>  
 SCSI HDD Capacity (Std/Max)<sup>8</sup>  
 Expansion Cards (Std/Max)<sup>9</sup>  
 SBB Number (Easy Access only)<sup>10</sup>

## BladeCenter™ HS20 At-A-Glance

8678-21X	2 <sup>1</sup>	1/2	512	512MB / 4GB <sup>2</sup>	Dual ATA-100	2/2	0/80GB	2x 10/100/1000	Y	ATI Rage XL/ 8MB	0/1	U320	2/2	0/293.6GB	0/1	48P7066
8678-41X	2.4 <sup>1</sup>	1/2	512	512MB / 4GB <sup>2</sup>	Dual ATA-100	2/2	0/80GB	2x 10/100/1000	Y	ATI Rage XL/ 8MB	0/1	U320	2/2	0/293.6GB	0/1	48P7066
8678-51X	2.6 <sup>1</sup>	1/2	512	512MB / 4GB <sup>2</sup>	Dual ATA-100	2/2	0/80GB	2x 10/100/1000	Y	ATI Rage XL/ 8MB	0/1	U320	2/2	0/293.6GB	0/1	48P7066
8678-61X	2.8 <sup>1</sup>	1/2	512	512MB / 4GB <sup>2</sup>	Dual ATA-100	2/2	0/80GB	2x 10/100/1000	Y	ATI Rage XL/ 8MB	0/1	U320	2/2	0/293.6GB	0/1	48P7066

1. Intel Xeon processor with advanced transfer L2 cache and 400MHz (quad-pumped) Front-side Bus (FSB).

2. Two 256MB RDIMMs are standard, supporting two-way interleaving and Chipkill technology. The system architecture supports up to 8GB total memory using 2GB RDIMMS when available.

3. Maximum IDE HDD storage capacity based on two 40GB 5400rpm IDE HDDs. Space for only one IDE HDD is available if an expansion card is installed.

4. Broadcom 5703 dual integrated copper gigabit Ethernet controller.

5. System management functionality, interconnect network connectivity and console connectivity are managed through the standard management module. The standard integrated service processor monitors HS20 system management activity, communicating with the management module in the BladeCenter.

6. Optional HS20 SCSI Storage Expansion Unit (P/N 48P7058) provides an integrated single-channel Ultra320 storage controller and two hot-swap SCSI HDD bays. The expansion unit installs onto the HS20 by connecting the SCSI connector, then installing both units together into the BladeCenter. The storage expansion module is the same size as the HS20. The integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring.

7. Two hot-swap SCSI HDD bays and an integrated Ultra320 single-channel storage controller are provided in the HS20 SCSI Storage Expansion Unit.

8. Maximum capacity requires installing two 146.8GB SCSI HDDs. Mixing of Ultra320 and Ultra160 HDDs is supported, but the bus will operate at the speed of the lowest rated HDD.

9. HS20 Fibre Channel Expansion Card (P/N 48P7061) installs over IDE connector two attaching into the expansion card connector, preventing installation of a second IDE HDD. The expansion card includes two Fibre Channel channels and two ports. One channel connects the HS20 to one optional BladeCenter 2-port Fibre Channel Switch Module (P/N 48P7062) installed in switch module bay three. The second channel connects to a second optional Fibre Channel switch module in bay four, which provides a redundant environment. Ethernet and serial I/O expansion cards are planned for future release. Expansion card selections cannot be mixed within a single BladeCenter chassis because they must connect to switch modules installed in switch module bays three and four.

10. IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.



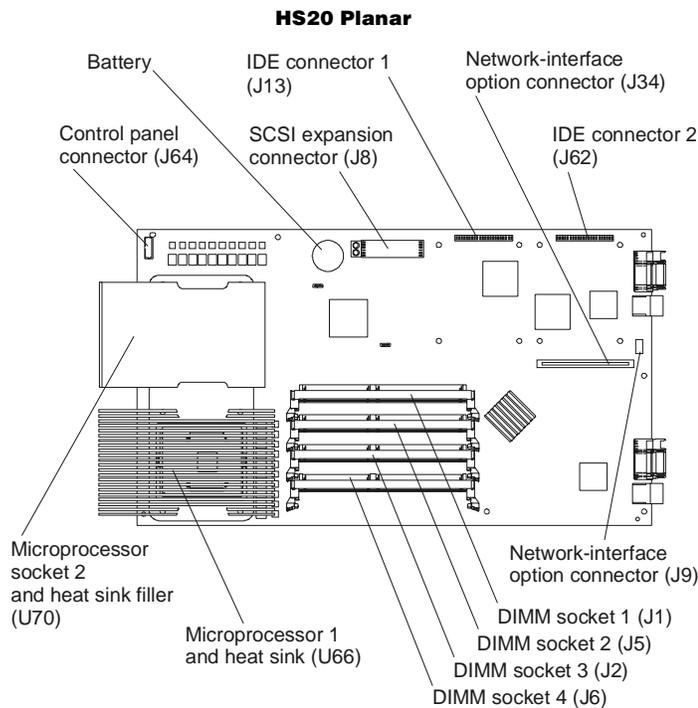
## HS20 Sales Building Blocks

SBB Number	Option Part Number	SBB Description	Rules
<b>Selectable Hardware</b>			
48P7067	48P7060	2GHz/400MHz 512KB L2 Cache with Xeon DP Processor	One standard with MTM. Selectable for CTO. A maximum of two allowed. Selected processors must be identical.
48P7069	48P7096	2.4GHz/400MHz 512KB L2 Cache with Xeon DP Processor	One standard with MTM. Selectable for CTO. A maximum of two allowed. Selected processors must be identical.
32P0915	33L5037	256MB PC2100 ECC DDR SDRAM RDIMM	Two standard installed in MTMs. Select in pairs for both CTM and MTM. Maximum of four supported.
37L3538	33L5038	512MB PC2100 ECC DDR SDRAM RDIMM	Select in pairs for both CTM and MTM. Maximum of four supported.
33P3126	33L5039	1GB PC2100 ECC DDR SDRAM RDIMM	Select in pairs for both CTM and MTM. Maximum of four supported.
48P7099	48P7063	HS20 40GB 5400rpm ATA-100 HDD	Maximum of two supported in CTO and MTM. Only one supported with expansion card installed.
48P7097	48P7058	HS20 SCSI Storage Expansion Unit	Includes integrated Ultra320 SCSI controller (onboard mirroring supported). Required to support up to two SCSI hot-swap HDDs.
32P9017	06P5754	18.2GB 10Krpm SCSI U160 HDD (Hot-swap)	Selectable for CTO and MTM. Up to two supported if SCSI Storage Expansion Unit is installed.
32P9018	06P5755	36.4GB 10Krpm SCSI U160 HDD (Hot-swap)	Selectable for CTO and MTM. Up to two supported if SCSI Storage Expansion Unit is installed.
32P9011	06P5756	73.4GB 10Krpm SCSI U160 HDD (Hot-swap)	Selectable for CTO and MTM. Up to two supported if SCSI Storage Expansion Unit is installed.
32P9024	06P5767	18.2GB 15Krpm SCSI U160 HDD (Hot-swap)	Selectable for CTO and MTM. Up to two supported if SCSI Storage Expansion Unit is installed.
32P9025	06P5768	36.4GB 15Krpm SCSI U160 HDD (Hot-swap)	Selectable for CTO and MTM. Up to two supported if SCSI Storage Expansion Unit is installed.
37L3539	06P5776	36.4GB 15Krpm SCSI U320 HDD (Hot-swap)	Selectable for CTO and MTM. Up to two supported if SCSI Storage Expansion Unit is installed.
59P6613	48P7061	HS20 Fibre Channel Expansion Card	Selectable for CTO and MTM. Limits IDE HDD selection to one. Includes two Fibre Channel controller ports that connect to a Fibre Channel switch module in switch module bay 3 or 4.
<b>Derived Hardware</b>			
22P0113	-	3.5in SL Hot-swap Bezel ASM (Filler)	Required for each open SCSI bay in SCSI Storage Expansion Unit.
48P7066	-	Blade Base Supporting 400MHz Front-side Bus Processors	Derived from processor selection for CTO. Includes planar and left cover.
48P7076	-	Heatsink Filler	Required for open processor socket.
59P6647	-	Blade Cover and Bus Terminator Card	Required for HS20 when a SCSI Storage Expansion unit is not attached.
<b>Software</b>			
22P0159	-	Windows 2000 Advanced Server (preloaded)	OS installed and configured with all hardware selections.
22P0160	-	Windows 2000 Server (preloaded)	OS installed and configured with all hardware selections.
25P2853	-	Unknown or not required	Hardware installed without OS limitations or compatibility.
24P3442	-	Windows 2000 Server (customer provided and installed)	Hardware selected for OS compatibility. OS not provided.
24P3445	-	Windows 2000 AdvancedServer (customer provided and installed)	Hardware selected for OS compatibility. OS not provided.
48P7914	-	Red Hat 73 (customer provided and installed)	Hardware selected for OS compatibility. OS not provided.
25P2854	-	Customer provided and installed	Operating System Language (OSL) for customer-provided or unknown OS.
59P3597	-	Windows 2000 Server (US English)	OSL for preloaded OS.
59P3598	-	Windows 2000 Advanced Server (US English)	OSL for preloaded OS.
<b>Manufacturing Instructions</b>			
59P5805	-	Enable onboard mirror - two identical HDDs required	Required for onboard mirroring of two identical SCSI HDDs installed in a SCSI Storage Expansion Unit.

## HS20 Processors

Option Part Number	Processor Upgrades	SMP Support <sup>1</sup>	SBB Number <sup>2</sup>
48P7060	2GHz 400MHz 512KB L2 Cache Xeon Processor	21X	48P7067
48P7096	2.4GHz 400MHz 512KB L2 Cache Xeon Processor	41X	48P7069
73P5982	Processor Upgrade with 2.6GHz/400MHz-512KB Cache Xeon Processor	51X	73P5997
73P5983	Processor Upgrade with 2.8GHz/400MHz-512KB Cache Xeon Processor	61X	73P5998

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed and cache size.  
 2. IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.



## HS20 Memory

Option Part Number	Memory Description <sup>1</sup>	SBB Number <sup>2</sup>
33L5037	256MB DDR PC2100 ECC RDIMM	32P0915
33L5038	512MB DDR PC2100 ECC RDIMM	37L3538
33L5309	1GB DDR PC2100 ECC RDIMM	33P3126

1. Due to two-way interleaving, installation of memory options in pairs is required. Standard RDIMMs are installed in sockets three and four. One RDIMM pair is not required to match the other. Provides Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips).  
 2. IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.



Total System Memory <sup>1</sup>	Quantity of RDIMMs Added		
	256MB (33L5037)	512MB (33L5038)	1GB (33L5039)
1GB	2	-	-
1.5GB	-	2	-
2GB <sup>2</sup>	-	-	2
2.5GB	-	-	2
3GB <sup>2</sup>	-	2	2
4GB <sup>2</sup>	-	-	4

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network operating systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory. The system architecture supports up to 8GB total memory when 2GB RDIMMs are available.

### HS20 Hard Disk Drive (HDD) Storage

SCSI HDD Configuration with Storage Expansion Unit Installed							
Total Int Storage <sup>1</sup>	10,000rpm HDDs				15,000rpm HDDs		
	18.2GB (06P5754)	36.4GB (06P5755, 32P0726) <sup>2</sup>	73.4GB (06P5756, 32P0727) <sup>2</sup>	146.8GB (32P0728)	18.2GB (06P5767)	36.4GB (06P5768, 06P5776, 32P0734) <sup>2</sup>	73.4GB (32P0735)
0GB	Standard on base models						
18.2GB	1	-	-	-	1	-	-
36.4GB	2	1	-	-	2	1	-
72.8GB	-	2	-	-	-	2	-
73.4GB	-	-	1	-	-	-	1
146.8GB	-	-	2	1	-	-	2
293.6GB	-	-	-	2	-	-	-

This table does not represent all possible HDD configurations. Total Internal Storage listed is within +/-0.2GB unless otherwise noted.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.
2. Mixing of Ultra160 and Ultra320 HDDs limits the bus to the lower rated performance.

HDD Options							
Option Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity <sup>1</sup>	SBB Number <sup>4</sup>	
<b>IDE HDD<sup>1</sup></b>							
48P7063	HS20 40GB 5400rpm ATA-100 HDD	5400	SL	1, 2	2	48P7099	
<b>Hot-swap Ultra160 HDDs<sup>2</sup></b>							
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1, 2	2	32P9017	
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1, 2	2	32P9108	
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-swap SL HDD	10000	SL	1, 2	2	32P9011	
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1, 2	2	32P9024	
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-swap SL HDD	15000	SL	1, 2	2	32P9025	
<b>Hot-swap Ultra320 HDDs<sup>2</sup></b>							
32P0726	36.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1, 2	2	32P0746	
32P0727	73.4GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1, 2	2	32P0747	
32P0728	146.8GB 10Krpm Ultra320 SCSI Hot-swap HDD	10000	SL	1, 2	2	32P0748	
06P5776	36.4GB 15Krpm Ultra320 SCSI Hot-swap SL HDD	15000	SL	1, 2	2	37L3539	
32P0734	36.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1, 2	2	32P0744	
32P0735	73.4GB 15Krpm Ultra320 SCSI Hot-swap HDD	15000	SL	1, 2	2	32P0745	
<b>Internal Storage Expansion</b>							
48P7058	SCSI Storage Expansion Unit <sup>3</sup>	-	-	-	-	48P7097	



- Up to two IDE HDDs may be installed in each HS20. The second IDE HDD cannot be added if a Fibre Channel expansion card is installed. IDE HDDs may remain installed when a SCSI Storage Expansion Unit and up to two SCSI HDDs are added to the configuration. Either the IDE or SCSI bus can support the boot disk. Onboard mirroring is not supported on the IDE bus.
- Two SCSI HDDs may be installed in a SCSI Storage Expansion Unit. The integrated Ultra320 SCSI controller supports both Ultra320 and Ultra160 HDDs, though bus speed is reduced to the rated performance of the slowest HDD. The LSI chipset supports onboard HDD mirroring when two identical SCSI HDDs are installed.
- Optional HS20 SCSI Storage Expansion Unit (P/N 48P7058) provides an integrated single-channel Ultra320 storage controller and two hot-swap SCSI HDD bays. The expansion unit installs onto the HS20 by connecting the SCSI connector, then installing both units together into the BladeCenter. The storage expansion unit mechanical is the same size as the HS20. The integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the slower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two matched SCSI HDDs to be allocated for mirroring.
- IBM offers configure-to-order (CTO) capability for selected products through Easy Access. Although similar to machine type models (MTM), CTO systems utilize different part numbers called Sales Building Blocks (SBB). The contents of an option may not entirely correspond to an SBB because only a certain component within an option package may be required to configure a specific system. Additional or different configuration rules or limitations may apply to the SBB. When a difference occurs, the rules will be documented in the tables, diagrams or footnotes.

## BladeCenter Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

### Microsoft Exchange Cluster Solution<sup>1</sup>

Part Number	Description	Quantity
8677-1XX	eServer BladeCenter	1
48P7052	BladeCenter 1200w Power Supply Modules	1 <sup>2</sup>
48P7054	BladeCenter 4-port Gigabit Ethernet Switch Module	2
48P7062	BladeCenter 2-port Fibre Channel Switch Module	2 <sup>3</sup>
8678-41X	BladeCenter HS20 2.4Ghz/512KB Xeon, 512MB ECC, open	14
33L5037	256MB DDR PC2100 ECC RDIMM	28 <sup>4</sup>
48P7061	HS20 Fibre Channel Expansion Card	14
<b>External Storage<sup>5</sup></b>		
17421RU	FASiT700 Storage Server	1
17401RU	FASiT EXP700 Storage Expansion Unit	16
06P5771	2Gbps FC 18.2GB/15K Drive	224 <sup>6</sup>

Note: This configuration supports 15,000 users.

- Rack, console and power options not included.
- Total of four power modules, which provides full redundancy. Two power modules are standard in BladeCenter.
- Each connected switch module port requires either a Short-wave or Long-wave SFP Module (P/N 19K1271, 2).
- Total memory of 1GB per HS20.
- Fibre Channel cable, SFP Modules and FASiT700 Mini Hubs not included.
- Fourteen Fibre Channel HDDs per FASiT EXP700.

### Citrix Solution<sup>1</sup>

Part Number	Description	Quantity
8677-1XX	eServer BladeCenter	1
48P7052	BladeCenter 1200w Power Supply Modules	1 <sup>2</sup>
48P7054	BladeCenter 4-port Gigabit Ethernet Switch Module	2
8678-41X	BladeCenter HS20 2.4Ghz/512KB Xeon, 512MB ECC, open	14
48P7063	BladeCenter 40GB 5400rpm ATA-100 HDD	28
33L5039	1GB DDR PC2100 ECC RDIMM	56 <sup>3</sup>

- Rack, console and power options not included.
- Total of four power modules, which provides full redundancy. Two power modules are standard in BladeCenter.
- Total memory of 4GB per HS20. Requires replacing the standard RDIMMs.



## IBM xSeries DC Power and NEBS-compliant Models

### EMEA Part Number Cross Reference

IBM xSeries DC Power and NEBS-compliant System Unit Part Numbers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
xSeries 305 DC Power Model				
K34AXxx	86734AX	8673-4AX	P4 2.4GHz/533MHz, 512KB, 256MB, 36.4GB U160, Rack	---
xSeries 335 DC Power Model				
P61AXxx	86761AX	8676-1AX	Xeon 2.8GHz/533MHz, 512KB, 512MB, Open Bay U320, Rack	---
xSeries 343 NEBS-compliant Model				
882714X	882714X	8827-14X	2xPIII 1.26GHz/133MHz, 512KB, 2GB, 36.4GB U160, Rack	---

# IBM xSeries DC Power and NEBS-compliant Models

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# xSeries DC Power and NEBS-compliant Models

## For Telecommunications Industry Applications

Refer to individual system sections for complete configuration details

Part Number  
 Processor Speed (GHz)  
 Number of Processors (Std/Max)  
 L2 ECC Cache  
 Memory (Std/Max)  
 Form Factor  
 Power Supply Quantity (Std/Max)  
 Hot-Swap (Power, Slots, HDD, Fans)  
 Redundancy (Optional, Standard)  
 System Management Processor  
 Onboard Ethernet (Mbps)  
 SCSI Controller (Dual, Ultra, RAID)  
 Removable Media Bays (Total/Avail)  
 Internal HDD Storage (Std/Max)  
 CD-ROM (IDE)  
 Bays (Total/Avail)  
 Slots (Total/Avail)

### xSeries DC Power and NEBS-compliant Models At-A-Glance

xSeries 305 DC Power Model																
8673-4AX <sup>1</sup>	2.4 <sup>2</sup>	1/1	512KB	256MB/4GB	Rack (1U)	1/1	-	-	N	2x10/100/1000	U160 <sup>3</sup>	2/0	36.4GB/293.6GB <sup>4</sup>	24x-10x	4/1	2/1
xSeries 335 DC Power Model																
8676-1AX <sup>5</sup>	2.8 <sup>6</sup>	1/2	512KB	512MB/8GB	Rack (1U)	1/1	H	-	Y	2x10/100/1000	U320 <sup>7</sup>	2/0	0/293.6GB <sup>8</sup>	24x-10x	4/2	2/2
xSeries 343 NEBS-compliant Model																
8827-14X <sup>9</sup>	1.26 <sup>10</sup>	2/2	512KB	2GB/6GB	Rack (2U)	2/2	P	S-Power	Y	2x10/100	D, U160 <sup>11</sup>	-	36.4GB/72.8GB <sup>12</sup>	24x-10x	4/1	6/6 <sup>13</sup>

- Includes a -48v to -60v 200w direct current (DC) power supply designed for utilization in a telecommunications network infrastructure.
- Intel Pentium 4 processor with advanced transfer L2 cache and 533MHz (quad-pumped) FSB.
- Single-channel Adaptec 29160 Ultra160 low-profile PCI SCSI storage controller installed in slot two.
- Maximum capacity requires removing the standard SCSI HDD and installing two 146.8GB SCSI HDDs.
- Includes a -48v to -60v 332w DC power supply designed for telecommunications applications.
- Intel Xeon processor with advanced transfer L2 cache and 533MHz (quad-pumped) FSB.
- The single-channel, Ultra320 integrated controller supports both Ultra160 and Ultra320 HDDs, but the entire SCSI bus will default to the lower rate (MB/second) if HDDs of different technologies are mixed on the same bus. The LSI chipset allows for two HDDs to be allocated for mirroring if a RAID adapter is not used to support the internal HDDs. Mirrored HDDs must match.
- Maximum capacity requires installing two 146.8GB SCSI HDDs. Mixing of Ultra320 and Ultra160 HDDs is supported, but the bus will operate at the speed of the lowest rated HDD.
- This system is Network Equipment Building System (NEBS) Level 3 compliant and includes two 350w, -48v DC power supplies requiring a direct current power source (-48v to -60v) for telecommunications applications.
- Intel Pentium III processor with 133MHz FSB and 512KB advanced transfer cache.
- Includes an integrated dual-channel Ultra 160 SCSI controller supporting both internal and external SCSI attachment.
- One 10,000rpm 36.4GB Ultra160 HDD ships standard with this specific NEBS configuration. Please contact your IBM representative, Business Partner or the IBM Help Center with questions regarding different NEBS configurations. This system does not support hot-swap HDDs.
- Optional third-party PCI networking adapters are supported on this system. Refer to ServerProven test results for supported third-party options at [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat). Select x343 from the Fast Access pulldown menu, click Go, then select the appropriate categories on the following screen. IBM makes no representations or warranties with respect to non-IBM products. These products are offered and warranted by third parties, not IBM.



# IBM External Storage Expansion & Fibre Channel

## EMEA Part Number Cross Reference

EXP300 Storage Expansion Unit				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35311RU	---	EXP300 Storage Expansion Unit	---

Notes 1&2

- Where 'xx' represents a specific country code as follows: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included as indicated.
- This unit does not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order one Rack Power Cable for each power supply.

FASt EXP500 Storage Expansion Unit				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
00N71xx	35601RU	---	FASt EXP500 Storage Expansion Unit	---

Notes 3&2

- Where 'xx' represents a specific country code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English.

FASt EXP700 Storage Expansion Unit				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
24P09xx	17401RU	---	FASt EXP700 Storage Expansion Unit	---

Notes 4&2

- Where 'xx' represents a specific country code as follows:- 01=Eur/English, 02=Eur/Spanish, 05=Denmark/English, 06=Israel/English, 07=Italy/English, 08=South Africa/English, 09=Switzerland/English, 12=UK/English.

Fibre Channel - FASt Storage Servers				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
19K11xx	35421RU	---	FASt 200 Storage Server	---
19K11xx	35422RU	---	FASt 200 HA Storage Server	---
00N69xx	35521RU	---	FASt500 Storage Server	---
24P09xx	17421RU	---	FASt700 Storage Server	---
71P81xx	174290U	---	FASt900 Storage Server	---

Notes 5&2

Notes 6&2

Notes 7&2

Notes 8&2

Notes 9&2

- Where 'xx' represents a specific country code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English..
- Where 'xx' represents a specific country code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English.
- Where 'xx' represents a specific country code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English.
- Where 'xx' represents a specific country code as follows:- 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 25=UK/English.
- Where 'xx' represents a specific country code as follows: 29=Euro/English, 30=Euro/Spanish, 31=Euro/French, 32=Euro/German, 33=Danish/, 34=Israel/English, 35=Italian/English, 36=South Africa/English, 37=Swiss/English, 38=Swiss/French, 39=Swiss/German, 40=UK/English.



# IBM External Storage Expansion & Fibre Channel

## EMEA Part Number Cross Reference

1Gb Fibre Channel Fabric Components				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION KEYBOARD AND MOUSE	EMEA WDFM DATE
35L1647	35341RU	---	SAN Fibre Channel Managed Hub	---



# IBM External Storage Expansion Unit Overview

Part Number	Subsystem Type	Total Bays	Hot-Swap Bays (total/avail)	Maximum Storage Capacity (GB)	Dimensions (W x D x H)	Form Factor	Max Cfg Wt	Power Supply
<b>Ultra SCSI External Expansion At-A-Glance</b>								
35311RU EXP300 <sup>1</sup>	Ultra160 LVDS	14	14/14 <sup>2</sup>	10276	444mm x 519mm x 127.5mm (17.5in x 20.4in x 5in)	Rack Drawer (3U) <sup>3</sup>	34.5kg (76.1lbs)	Redundant 500w
<b>Fibre Channel External Expansion At-A-Glance</b>								
35421RU FAST200	Fibre Channel	10	10/10	1,468	480mm x 575mm x 131.8mm (18.9in x 22.63in x 5.2in)	Rack Drawer (3U)	42.3kg (94lbs)	Redundant 350w
35422RU <sup>4</sup> FAST200 HA	Fibre Channel	10	10/10	1,468	480mm x 575mm x 131.8mm (18.9in x 22.63in x 5.2in)	Rack Drawer (3U)	42.3kg (94lbs)	Redundant 350w
35601RU <sup>5</sup> FAST EXP500	Fibre Channel	10	10/10	1,468	447mm x 563mm x 128mm (17.6in x 22.2in x 5in)	Rack Drawer (3U)	36.1kg (79.6lbs)	Redundant 350w
17401RU <sup>6</sup> FAST EXP700	Fibre Channel	14	14/14 <sup>2</sup>	2,055.2	482mm x 597mm x 132mm (18.97in x 23.52in x 5.21in)	Rack Drawer (3U)	41.47kg (91.42lbs)	Redundant 400w

IBM Storage Expansion Unit

1. To attach a SCSI storage enclosure to an xSeries server, an appropriate RAID controller and external cable is required. See Appendix D: Cables - Storage Units - Controllers.
2. Supports slim-line drives only (FAST EXP500 supports either half-high or slim-line HDDs).
3. A rack-to-tower conversion kit option (P/N 09N7296) is available.
4. Identical to FAST200 (P/N 35421RU) with the addition of a FAST200 Redundant RAID Controller (P/N 19K1121).
5. Attachment to a FAST500 Storage Server (P/N 35521RU) or FAST700 Storage Server (P/N 17421RU) is required. This expansion unit does not attach directly to an xSeries server. See FAST EXP500 section for more information.
6. Attachment to a FAST700 Storage Server (P/N 17401RU) is required. This expansion unit does not attach directly to an xSeries server. See FAST EXP700 section for more information.



# IBM EXP300 (35311RU)

## EXP300 Hard Disk Drive (HDD) Storage

Total Int Storage <sup>1</sup>	10,000rpm HDDs			15,000rpm HDDs	
	18.2GB (06P5754)	36.4GB (06P5755)	73.4GB (06P5756)	18.2GB (06P5767)	36.4GB (06P5768)
0GB	Standard in base model				
18.2GB	1	-	-	1	-
36.4GB	2	1	-	2	1
54.6GB	3	-	-	3	-
72.8GB	4	2	-	4	2
91GB	5	-	-	5	-
109.2GB	6	3	-	6	3
127.4GB	7	-	-	7	-
145.6GB	8	4	-	8	4
182GB	10	5	-	10	5
218.4GB	12	6	-	12	6
254.8GB	14	7	-	14	7
291.2GB	-	8	-	-	8
364.0GB	-	10	-	-	10
436.8GB	-	12	-	-	12
509.6GB	-	14	-	-	14
587.2GB	-	-	8	-	-
734GB	-	-	10	-	-
880.8GB	-	-	12	-	-
1027.6GB (max)	-	-	14	-	-

This table does not represent all possible HDD configurations.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported <sup>1</sup>	Maximum Quantity
<b>Ultra 160 HDDs</b>					
06P5754	18.2GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	1 ... 14	14 <sup>2</sup>
06P5755	36.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	1 ... 14	14 <sup>2</sup>
06P5756	73.4GB 10Krpm Ultra160 SCSI Hot-Swap SL HDD	10000	SL	1 ... 14	14 <sup>2</sup>
06P5767	18.2GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	1 ... 14	14 <sup>2</sup>
06P5768	36.4GB 15Krpm Ultra160 SCSI Hot-Swap SL HDD	15000	SL	1 ... 14	14 <sup>2</sup>
<b>External Storage Expansion Units</b>			<b>Form Factor</b>		
35311RU	EXP300 Storage Expansion Unit <sup>3</sup>	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			

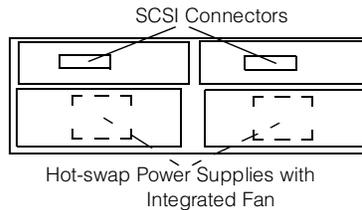
1. EXP300 Storage Expansion Unit ships with 14 slim-line hot-swap bays which can be configured as a single bus, two independent buses or a twintailed single bus.

2. Twintailing reduces the maximum number of HDDs on a single bus to 13.

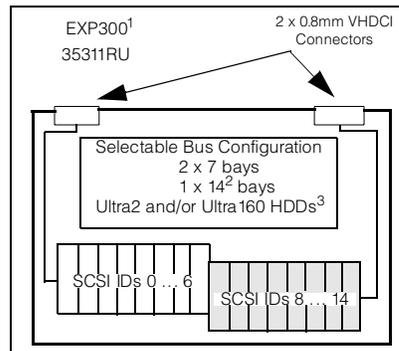
3. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.

SCSI ID	Form Factor	Height	Front Access	Usage
0 ... 6	HS	SL	Yes	open
8 ... 14	HS	SL	Yes	open

### EXP300 Storage Expansion Unit 35311RU



- Fourteen slim-high drive bays.
- Supports Ultra160 SCSI data transfer speeds - up to 160MB/s.
- Single or dual SCSI bus configurations.
- Dual hot-swap 500W redundant power supplies with integrated fan assemblies.
- Height is 3U (1U=1.75in or 44.45mm).
- Tower capability through optional Rack-to-Tower Conversion Kit.



1. Housed in a 19in rack mountable drawer and ships standard with redundant 500W hot-swap power supplies, two power cords and a single 2M Ultra2 SCSI cable capable of supporting Ultra160 speeds.
2. Twintailing reduces the maximum number of HDDs on a single bus to 13.
3. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDDs may be mixed on the same bus and operate at up to their maximum respective speeds.

Requires IBM NetBAY 42 Enterprise Rack or Expansion Cabinet (930842S, E), NetBAY 42 Standard Rack Cabinet or Expansion Cabinet (9306420, 1), NetBAY 25 (9306250), NetBAY 11 (9306110) or Rack-to-Tower Conversion Kit (09N7296).

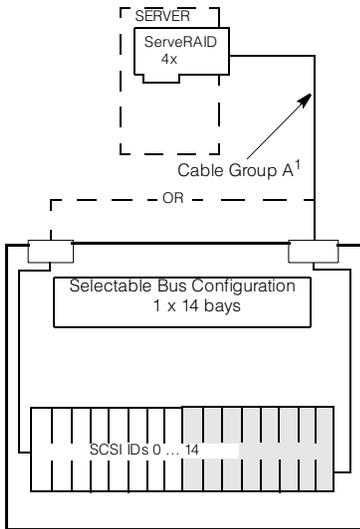
External Storage Expansion Units require storage controllers and external cables. Select a supported RAID controller from the system configurator and cables from Appendix D: Cables - Storage Units - Controllers.

### Cables and Controllers: See Appendix D: Cables - Storage Units - Controllers



## EXP300 Sample Configurations

### EXP300 One Independent SCSI Bus



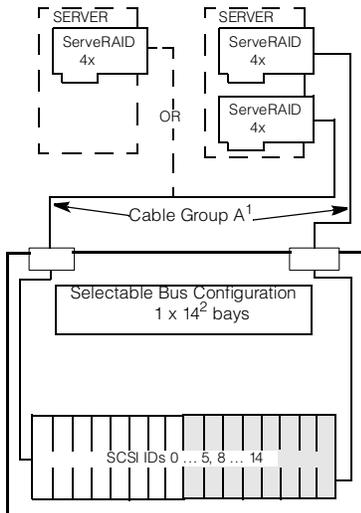
Order:

- 1 x 35311RU
- 1 x External Cable from Group A<sup>1</sup>
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable group A.

### EXP300 One Independent Twintail SCSI Bus High Availability Configuration

To configure as one independent twintailed 13-bay SCSI bus, attach two external cables from two ServeRAID adapters, in the same or separate servers, to the two external ports of the EXP300. The EXP300 must be set for 1 x 14<sup>2</sup> bays.



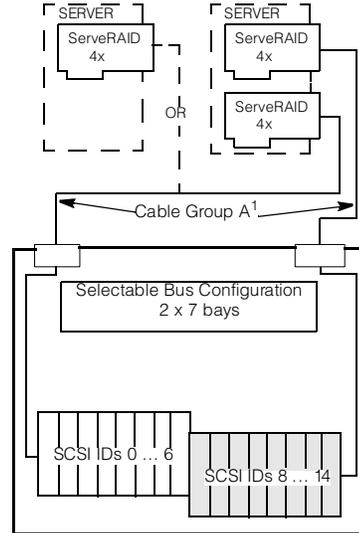
Order:

- 1 x 35311RU
- 2 x External Cables from Group A<sup>1</sup>
- Up to 13 Ultra2 and/or Ultra160 HDDs

1. One 2M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable group A.  
2. Twintailing reduces the maximum number of HDDs on a single bus to 13.

### EXP300 Two Independent SCSI Buses

To configure as two independent seven-bay SCSI buses, attach two external cables from two ServeRAID adapters, in the same or separate servers, to the two external ports of the EXP300. The EXP300 must be set for 2 x 7 bays.



Order:

- 1 x 35311RU
- 2 x External Cables from Group A<sup>1</sup>
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable group A.



# Fibre Channel Solutions Overview

## Fibre Channel Solutions Overview At-A-Glance

Part Number	Description	Max Supported Storage	Host Partitions	Host Fabric Ports (stdlmax)	Max Redundant Host Connections	Drive Side Mini Hubs (stdlmax)	Redundant Drive Loops (stdlmax)	Form Factor
<b>FAST Storage Servers</b>								
35421RU	FAST200 Storage Server	1.468TB <sup>1</sup>	16	1/1	-	-	-	3U
35422RU	FAST200 HA Storage Server	8.8TB <sup>2</sup>	16	2/2	1	-	1/1	3U
35521RU	FAST500 Storage Server	32.296TB <sup>3</sup>	16	4/8	4	2/4	1/2	4U
17421RU	FAST700 Fibre Channel Storage Server	32.883TB <sup>4</sup>	64	4/8	4	2/4	1/2	4U
174290U	FAST900 Storage Server (US line cord) <sup>5</sup>	32.883TB <sup>4</sup>	64	4/8	4	2/4	1/2	4U
<b>Fibre Channel HDD Expansion Units</b>								
35601RU	FAST EXP500 Storage Expansion Unit	1.468TB	-	-	-	-	-	3U
17401RU	FAST EXP700 Storage Expansion Unit	2.0552TB	-	-	-	-	-	3U
<b>1Gb Fibre Channel Fabric Components</b>								
00N6881	FAST Host Adapter	-	-	-	-	-	-	-
00N6882	FAST500 Mini Hub	-	-	-	-	-	-	-
00N6883	FAST500 256MB Cache	-	-	-	-	-	-	-
19K1121	FAST200 Redundant RAID Controller	-	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router UltraSCSI LVD Port	-	-	-	-	-	-	-
03K9307	FC Long-wave GBIC	-	-	-	-	-	-	-
03K9308	FC Short-wave GBIC	-	-	-	-	-	-	-
03K9305	Fibre Channel 25m Cable	-	-	-	-	-	-	-
03K9306	Fibre Channel 5m Cable	-	-	-	-	-	-	-
36L9973	Fibre Channel 1m Cable	-	-	-	-	-	-	-
<b>2Gb Fibre Channel Fabric Components</b>								
24P0960	FC2-133 Host Bus Adapter	-	-	-	-	-	-	-
19K1269	FAST700 Mini Hub	-	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08, 8-port <sup>6</sup>	-	-	-	-	-	-	-
2109F16	SAN FC Switch, 16-Port <sup>7</sup>	-	-	-	-	-	-	-
19K1271	Short-wave SFP Module	-	-	-	-	-	-	-
19K1272	Long-wave SFP Module	-	-	-	-	-	-	-
19K1247	1m LC-LC Fibre Channel Cable	-	-	-	-	-	-	-
19K1248	5m LC-LC Fibre Channel Cable	-	-	-	-	-	-	-
19K1249	25m LC-LC Fibre Channel Cable	-	-	-	-	-	-	-
19K1250	LC-SC Fibre Channel Adapter Cable <sup>8</sup>	-	-	-	-	-	-	-
<b>Fibre Channel HDDs</b>								
19K0653	36.4GB 10K-4 FC Hot-swap HDD	-	-	-	-	-	-	-
19K0654	73.4GB 10K-4 FC Hot-swap HDD	-	-	-	-	-	-	-
06P5707	18.2GB 15Krpm FC Hot-swap HDD	-	-	-	-	-	-	-
06P5761	2Gbps FC 36.4GB/10K Drive	-	-	-	-	-	-	-
06P5762	2Gbps FC 73.4GB/10K Drive	-	-	-	-	-	-	-
32P0765	146.8GB Fibre Channel Disk Drive Module	-	-	-	-	-	-	-
06P5771	2Gbps FC 18.2GB/15K Drive	-	-	-	-	-	-	-
06P5772	2Gbps FC 36.4GB/15K Drive	-	-	-	-	-	-	-
32P0768	73.4GB/15K Disk Module	-	-	-	-	-	-	-

1. Attaching expansion units to a FAST200 Storage Server is not recommended because a single point-of-failure occurs when external storage is connected through only one RAID controller. The maximum storage value is based on 10 internal 146.8GB internal FC HDDs.  
 2. Based on a maximum of 60 146.8GB FC HDDs installed in the redundant storage loop that includes the FAST200 internal HDD bays and five FAST EXP500 expansion units.  
 3. Based on a maximum of 220 146.8GB FC HDDs installed in a maximum of 22 FAST EXP500 expansion units. A maximum of 11 expansion units are supported in a redundant drive loop (cable pair). Four drive-side mini hubs are required to support two loops running in redundant mode.  
 4. Based on a maximum of 224 146.8GB Fibre Channel HDDs installed in a maximum of 16 FAST EXP700 expansion units. A maximum of eight expansion units are supported in a redundant drive loop (cable pair). Four drive-side mini hubs are required to support two loops running in redundant mode.



5. Additional options include FlashCopy Activation (P/N 24P7985), Remote Mirror Activation (P/N 24P7986), Upgrade from 16 to 64 Storage Partitions (P/N 24P7984) and Host Kits for AIX, Sun and HP servers (P/N 24P7981, 24P7982, 24P7983).
6. Additional related options include F08 Full Fabric Activation (P/N 18P5060) and Performance Bundle Activation (P/N 18P4405).
7. Additional related options include Remote Switch Activation (P/N 18P3536), Extended Fabric Activation (P/N 18P3580) and F16 Performance Bundle Activation (P/N 18P3590). Power cords for nonrack installation are available by country.
8. The LC-SC Fibre Channel Adapter Cable (P/N 19K1250) is designed to connect any 1Gb device or cable to any 2Gb device or cable. When 2Gb and 1Gb technology are combined in a configuration, the signal transfer automatically converts to the slower speed.



# IBM FASTT200 Storage Server (3542xRU)

FASTT200 Storage Server

## FASTT200 (HA) Storage Expansion Unit

Total Internal Storage <sup>1</sup>	10,000rpm HDDs			15,000rpm HDDs		
	36.4GB (19K0653, 06P5761)	73.4GB (19K0654, 06P5762)	146.8GB (32P0765)	18.2GB (06P5707, 06P5771)	36.4GB (06P5772)	73.4GB (32P0768)
0GB	Standard in base model					
18.2GB	-	-	-	1	-	-
36.4GB	1	-	-	2	1	-
54.6GB	-	-	-	3	-	-
72.8GB	2	-	-	4	2	-
73.4GB	-	1	-	-	-	1
91GB	-	-	-	5	-	-
109.2GB	3	-	-	6	3	-
145.6GB	4	-	-	8	4	-
146.8GB	-	2	1	-	-	2
182GB	5	-	-	10	5	-
218.4GB	6	-	-	-	6	-
220.2GB	-	3	-	-	-	3
254.8GB	7	-	-	-	7	-
291.2GB	8	-	-	-	8	-
293.6GB	-	4	2	-	-	4
327.6GB	9	-	-	-	9	-
364GB	10	-	-	-	10	-
367GB	-	5	-	-	-	5
440.4GB	-	6	3	-	-	6
513.8GB	-	7	-	-	-	7
587.2GB	-	8	4	-	-	8
660.6GB	-	9	-	-	-	9
734GB	-	10	5	-	-	10
880.8GB	-	-	6	-	-	-
1027.6GB	-	-	7	-	-	-
1174.4GB	-	-	8	-	-	-
1321.2GB	-	-	9	-	-	-
1468GB	-	-	10	-	-	-

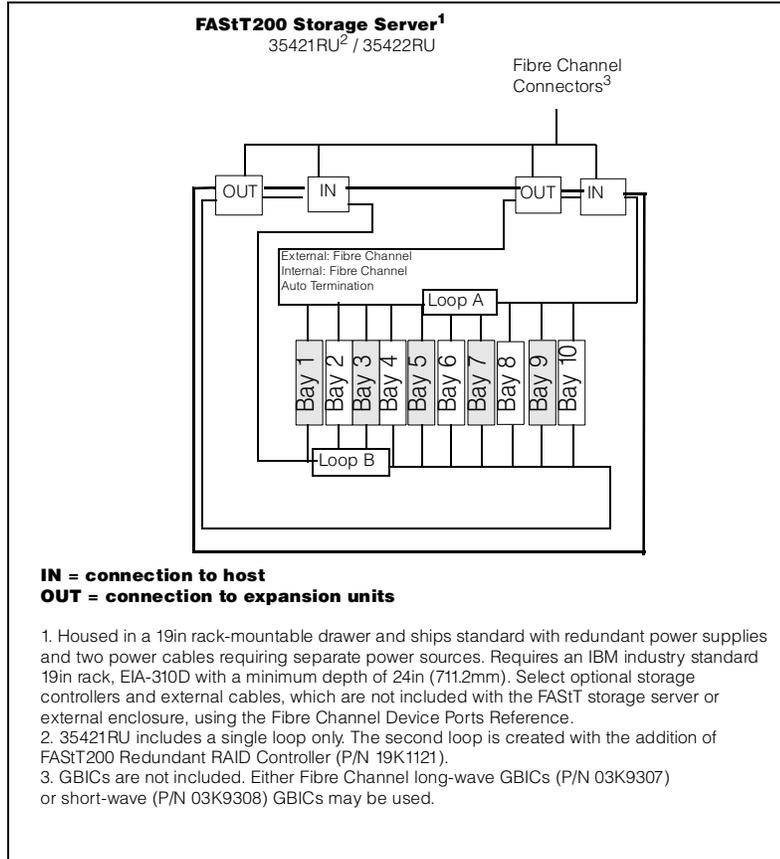
This table does not represent all valid HDD configurations.

1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the HDD of choice. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
19K0653	Netfinity 36.4GB 10K-4 FC Hot-Swap HDD	10,000	SL	1 ... 10	10
19K0654	Netfinity 73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1 ... 10	10
06P5707	Netfinity 18.2GB 15Krpm FC Hot-Swap HDD	15,000	SL	1 ... 10	10
06P5761	2Gbps FC 36.4GB/10K Drive	10,000	SL	1 ... 10	10
06P5762	2Gbps FC 73.4GB/10K Drive	10,000	SL	1 ... 10	10
32P0765	146.8GB Fibre Channel Disk Drive Module	10,000	SL	1 ... 10	10
06P5771	2Gbps FC 18.2GB/15K Drive	15,000	SL	1 ... 10	10
06P5772	2Gbps FC 36.4GB/15K Drive	15,000	SL	1 ... 10	10
32P0768	73.4GB/15K Disk Module	15000	SL	1 ... 10	10
External Storage Expansion Units		Form Factor			
35421RU	FASTT200 Storage Server <sup>1,2</sup>	Rack (3U)			
35422RU	FASTT200 HA Storage Server <sup>1</sup>	Rack (3U)			
19K1121	FASTT200 Redundant RAID Controller	-			

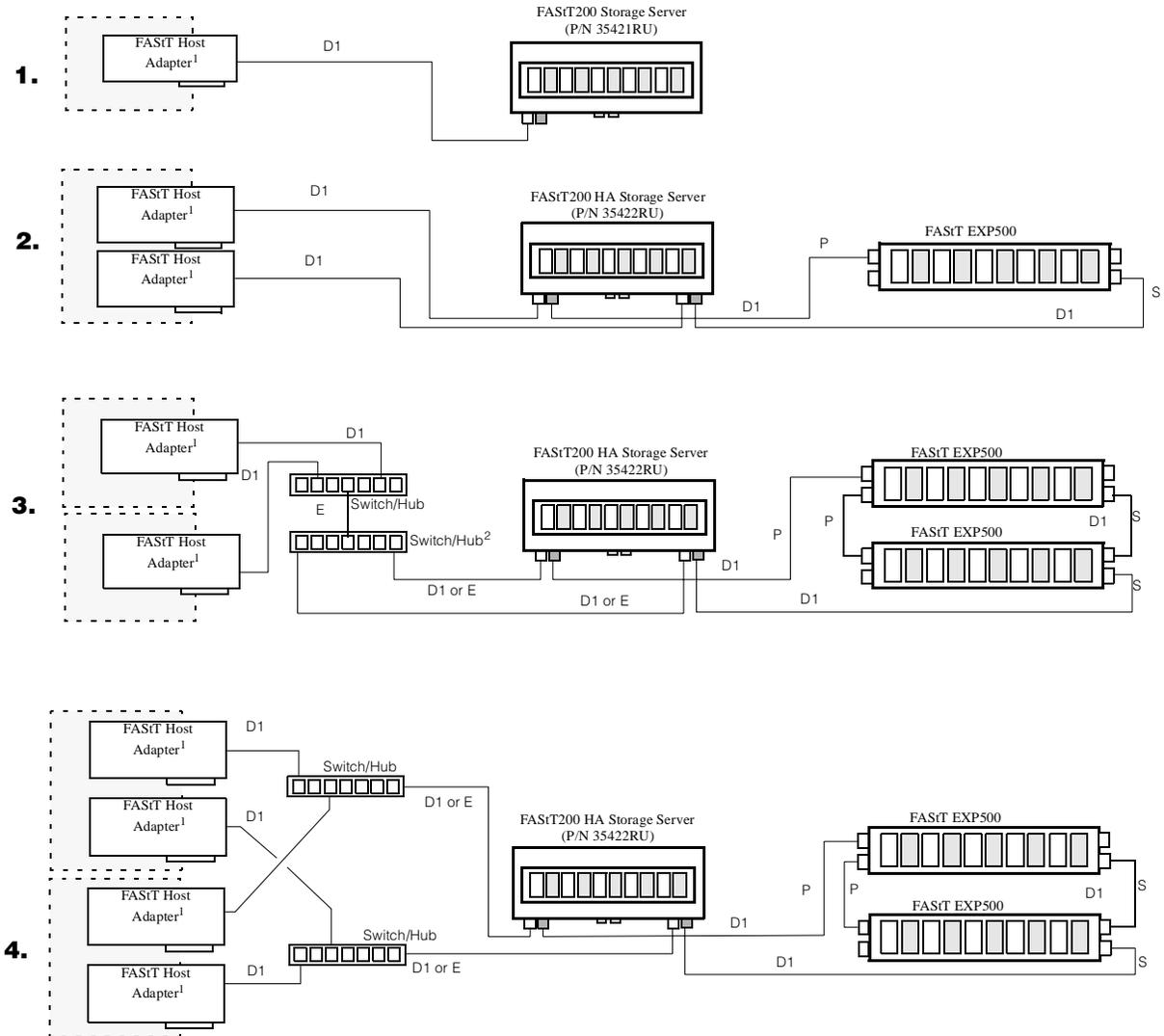
1. The FASTT200 includes two hot-swap, 350W auto-ranging redundant power supplies, each with its own power cord.

2. Can be upgraded to FASTT200 HA Storage Server through the addition of a FASTT200 Redundant RAID Controller (P/N 19K1121).



### Fibre / Fibre Configuration Examples (FAST200)

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



1. FAST200 Host Adapter (P/N 00N6881) supports short-wave connections only.

2. Buffering the long-wave optic cable expanse with a second switch or hub at the remote storage location is required to requalify the signal. A managed hub supports only one long-wave GBIC.

- P = primary path, S = secondary (redundant) path
- Shaded boxes represent separate hosts.
- Cable groups are represented by letters in parenthesis.
- Maximum of 60 external storage HDDs are supported for optimum performance (up to 10 in the storage server with the remainder in expansion units).
- The number of servers that can be used in configurations with managed hubs or Fibre Channel switches are dependent on partitioning restrictions of the management system or cluster software.
- An optional short- or long-wave GBIC is required for all FAST200 storage server and FAST200 EXP500 storage connections. GBICs are not depicted in these diagrams. See device drawings at the end of this section for details.
- Other Fibre Channel devices may not require optional GBICs. For specific requirements, see the Fibre Device Ports Reference.

**Refer to the following Supported Cable Groups chart for cable type definitions.**



## Supported Cable Groups

<b>Cable Group A (0.8mm to 0.8mm)</b>	
03K9310	Netfinity 2m Ultra2 SCSI Cable
03K9311	Netfinity 4.2m Ultra2 SCSI Cable
37L7101	Netfinity 20m Ultra2 SCSI Cable
<b>Cable Group D (short-wave Fibre Channel)</b>	
<i>Group D1 - 1Gb (SC-SC) short-wave Fibre Channel cables</i>	
36L9973	Netfinity Fibre Channel 1m Cable
03K9306	Netfinity Fibre Channel 5m Cable
03K9305	Netfinity Fibre Channel 25m Cable
<i>Group D2 - 2Gb (LC-LC) short-wave Fibre Channel cables</i>	
19K1247	1m LC-LC Fibre Channel Cable
19K1248	5m LC-LC Fibre Channel Cable
19K1249	25m LC-LC Fibre Channel Cable
Customer-supplied short-wave cable of up to 500m (0.31 miles)	
<b>Cable Group E (long-wave Fibre Channel)</b>	
Customer-supplied long-wave cable of up to 10km (6.2 miles)	
<b>Fibre Channel Connectors</b>	
<i>1Gb (SC-SC) GBICs</i>	
03K9308	Netfinity Fibre Channel Short-wave GBIC
03K9307	Netfinity Fibre Channel Long-wave GBIC
<i>2Gb (LC-LC) SFP Modules</i>	
19K1271	Short-wave SFP Module
19K1272	Long-wave SFP Module
<i>2Gb to 1Gb (LC-SC) adapter</i>	
19K1250	LC-SC Fibre Channel Adapter Cable



# IBM FAST EXP500 (35601RU)

## FAST EXP500 Storage Expansion Unit

Total Internal Storage <sup>1</sup>	10,000rpm HDDs			15,000rpm HDDs		
	36.4GB (19K0653, 06P5761)	73.4GB (19K0654, 06P5762)	146.8GB (32P0765)	18.2GB (06P5707, 06P5771)	36.4GB (06P5772)	73.4GB (32P0768)
0GB	Standard in base model					
18.2GB	-	-	-	1	-	-
36.4GB	1	-	-	2	1	-
54.6GB	-	-	-	3	-	-
72.8GB	2	-	-	4	2	-
73.4GB	-	1	-	-	-	1
91GB	-	-	-	5	-	-
109.2GB	3	-	-	6	3	-
145.6GB	4	-	-	8	4	-
146.8GB	-	2	1	-	-	2
182GB	5	-	-	10	5	-
218.4GB	6	-	-	-	6	-
220.2GB	-	3	-	-	-	3
254.8GB	7	-	-	-	7	-
291.2GB	8	-	-	-	8	-
293.6GB	-	4	2	-	-	4
327.6GB	9	-	-	-	9	-
364GB	10	-	-	-	10	-
367GB	-	5	-	-	-	5
440.4GB	-	6	3	-	-	6
513.8GB	-	7	-	-	-	7
587.2GB	-	8	4	-	-	8
660.6GB	-	9	-	-	-	9
734GB	-	10	5	-	-	10
880.8GB	-	-	6	-	-	-
1027.6GB	-	-	7	-	-	-
1174.4GB	-	-	8	-	-	-
1321.2GB	-	-	9	-	-	-
1468GB	-	-	10	-	-	-

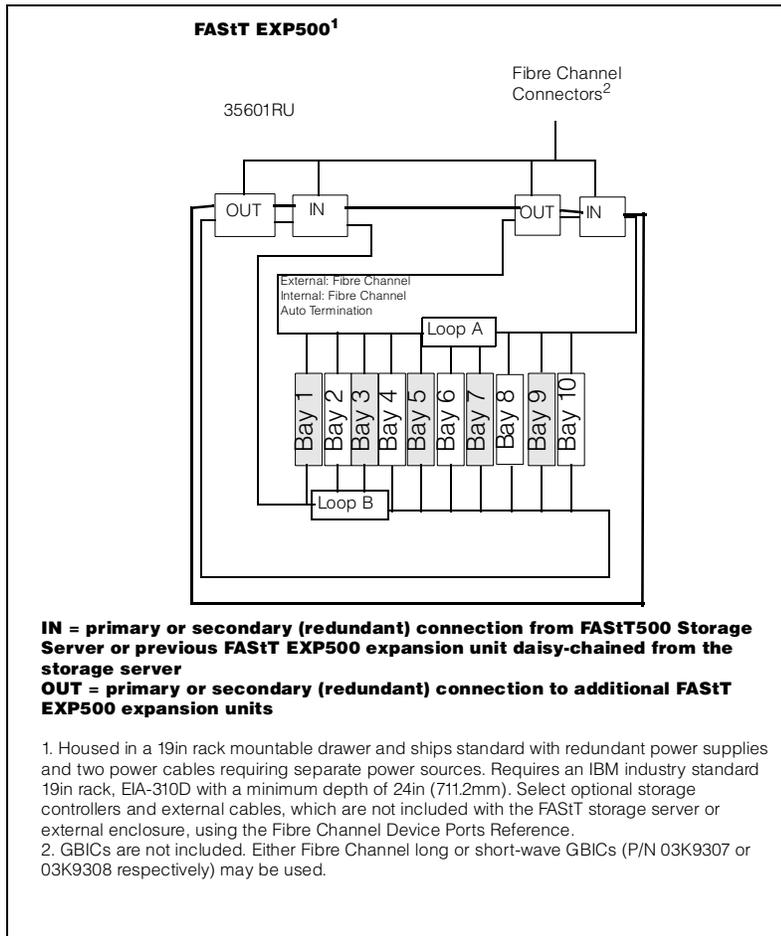
This table does not represent all valid HDD configurations.

1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the HDD of choice. Total internal storage listed is within +/- 0.2GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
19K0653	Netfinity 36.4GB 10K-4 FC Hot-Swap HDD	10,000	SL	1 ... 10	10
19K0654	Netfinity 73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1 ... 10	10
06P5707	Netfinity 18.2GB 15Krpm FC Hot-Swap HDD	15,000	SL	1 ... 10	10
06P5761	2Gbps FC 36.4GB/10K Drive	10,000	SL	1 ... 10	10
06P5762	2Gbps FC 73.4GB/10K Drive	10,000	SL	1 ... 10	10
32P0765	146.8GB Fibre Channel Disk Drive Module	10,000	SL	1 ... 10	10
06P5771	2Gbps FC 18.2GB/15K Drive	15,000	SL	1 ... 10	10
06P5772	2Gbps FC 36.4GB/15K Drive	15,000	SL	1 ... 10	10
32P0768	73.4GB/15K Disk Module	15,000	SL	1 ... 10	10
External Storage Expansion Units		Form Factor			
35601RU	FAST EXP500 Storage Expansion Unit <sup>1</sup>	Rack (3U)			

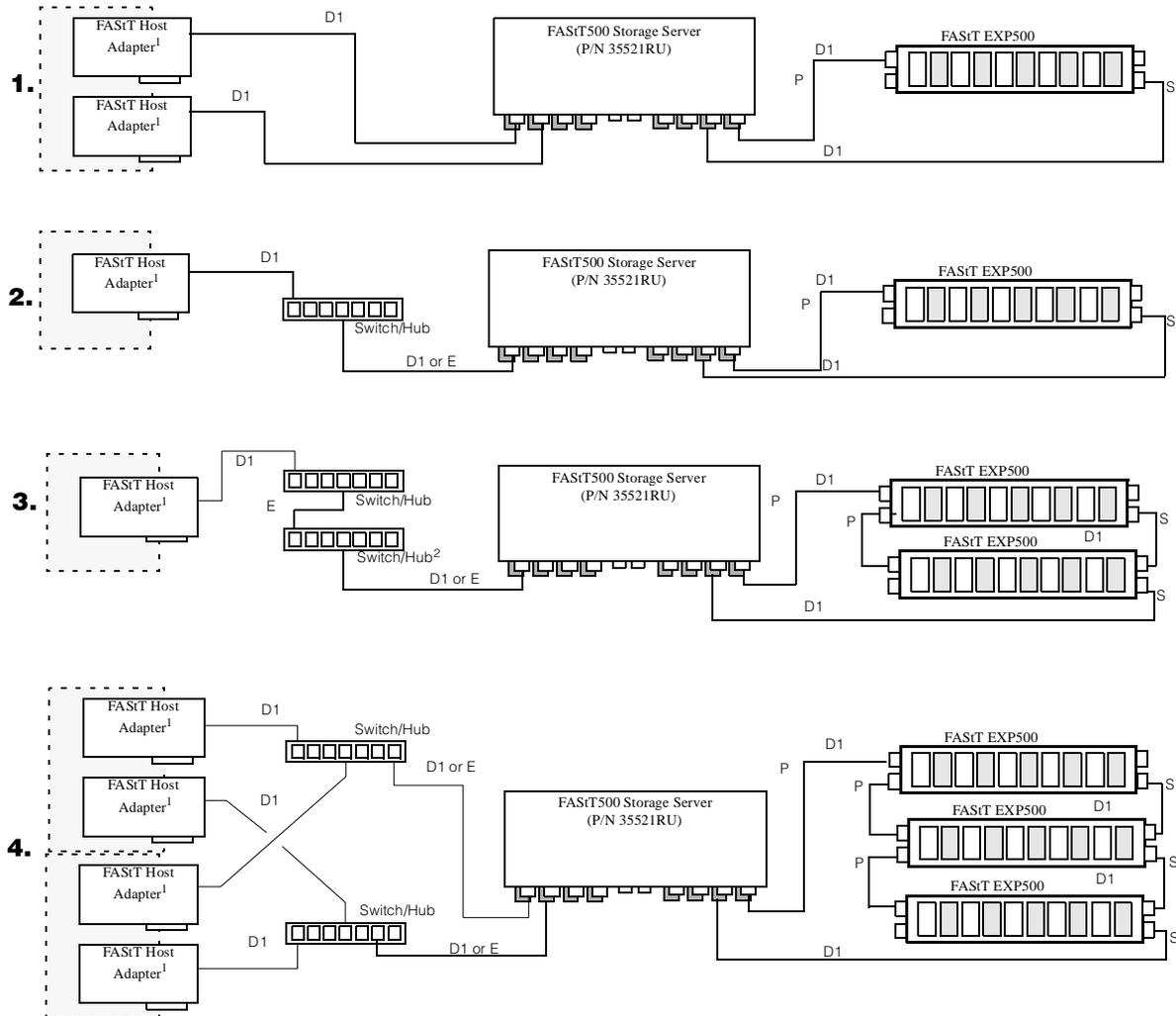
1. The FAST EXP500 includes two hot-swap, 350W auto-ranging redundant power supplies, each with its own power cord.

IBM FAST EXP500



### Fibre / Fibre Configuration Examples **FAST EXP500 with FAST500 Storage Server**

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



IBM FAST EXP500

1. FAST Host Adapter (P/N 00N6881) supports shortwave connections only.  
 2. Buffering the long-wave optic cable expanse with a second switch or hub at the remote storage location is required to requalify the signal.

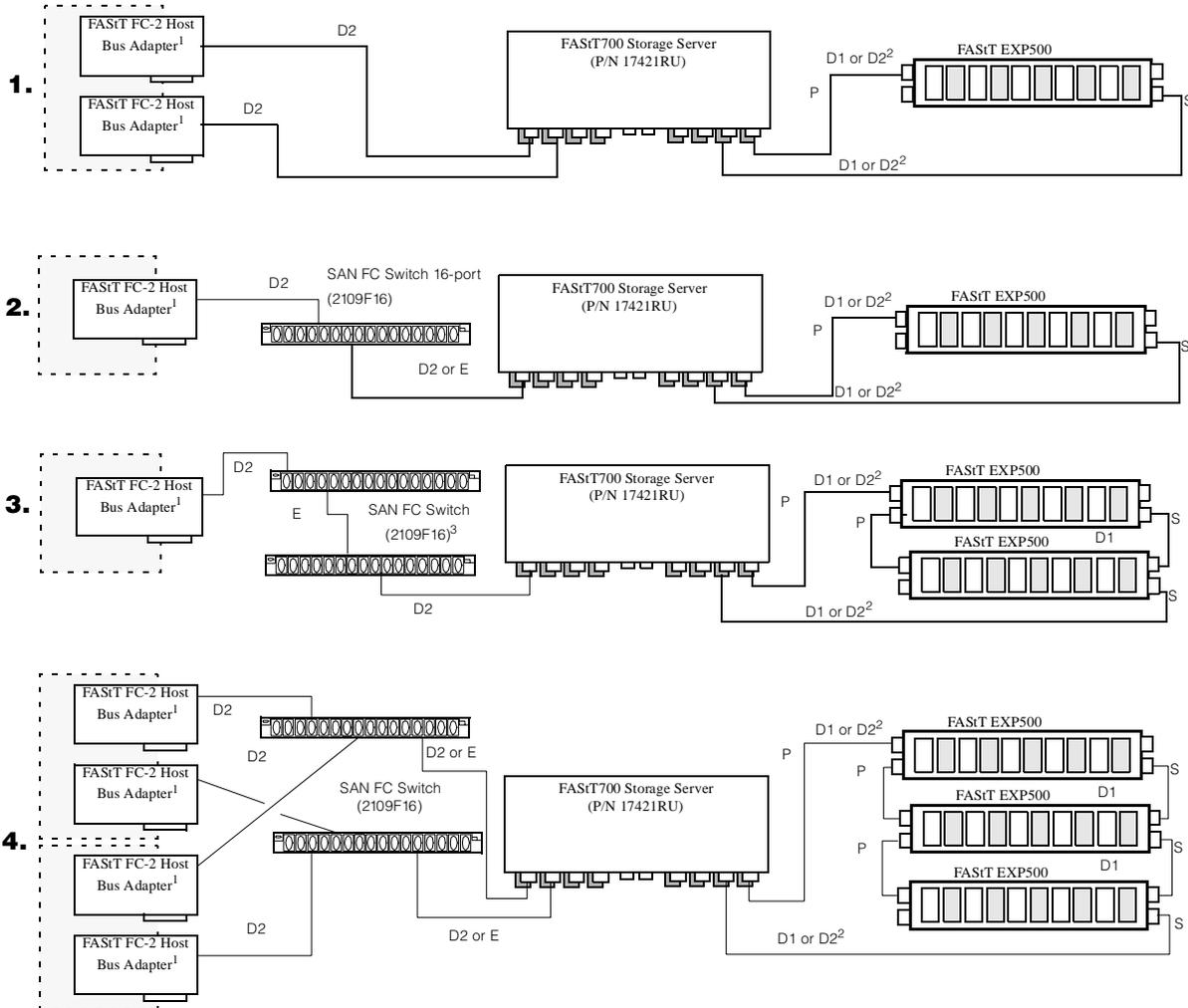
- P = primary path, S = secondary (redundant) path
- Shaded boxes represent separate hosts.
- Cable groups are represented by letters in parenthesis.
- Maximum of 220 external storage HDDs are supported through 11 enclosures in each cable pair.
- The number of servers that can be used in configurations with managed hubs or Fibre Channel switches are dependent on partitioning restrictions of the management system or cluster software.
- An optional short- or long-wave GBIC is required for all FAST500 storage server and FAST EXP500 storage connections. GBICs are not depicted in these diagrams. See device drawings at the end of this section for details. Other Fibre Channel devices may not require optional GBICs. For specific requirements, see the Fibre Device Ports Reference.

**Refer to the Supported Cable Groups chart following the FAST 200 configuration examples for cable type definitions.**



### Fibre / Fibre Configuration Examples **FAST EXP500 with FAST700 Fibre Channel Storage Server**

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



1. FAST FC-2 Host Bus Adapter (P/N 19K1246) includes an integrated short-wave SFF Module, supporting short-wave connections only.
2. Fibre Channel connections to the FAST EXP500 require GBICs. LC-LC Fibre Channel cable does not connect directly into a GBIC. LC-SC Fibre Channel Adapter Cable (P/N 19K1250) is required. Use SC Fibre Channel cable for daisy-chaining FAST EXP500 units (see the Supported Cable Groups chart for a list of SC cables).
3. Buffering the long-wave optic cable expanse with a second switch or hub at the remote storage location is required to requalify the signal.

- P = primary path, S = secondary (redundant) path
- Shaded boxes represent separate hosts.
- Cable groups are represented by letters in parenthesis.
- Maximum of 220 external storage HDDs are supported through a maximum of 11 enclosures in each channel pair (22 enclosures total).
- The number of servers that can be used in configurations with managed hubs or Fibre Channel switches are dependent on partitioning restrictions of the management system or cluster software.
- An optional short- or long-wave GBIC is required for all FAST500 EXP500 storage connections. FAST700 and 2Gb FC switch connections require SFP Modules. LC-SC FC Adapter Cables are required to connect LC-LC FC cables to GBICs in FAST EXP500 connections. GBICs, SFP Modules and adapter cables are not depicted in these diagrams. See device drawings at the end of this section for details.
- For specific requirements concerning connections, refer to the Fibre Device Ports Reference or Fibre Interconnection Guidelines.

**Refer to the Supported Cable Groups chart following the FAST 200 configuration examples for cable type definitions.**



# IBM FAStT EXP700 (17401RU)

## FAStT EXP700 Storage Expansion Unit

Total Internal Storage <sup>1</sup>	10,000RPM HDDs			15,000RPM HDDs		
	36.4GB (06P5761)	73.4GB (06P5762)	146.8GB (32P0765)	18.2GB (06P5771)	36.4GB (06P5772)	73.4GB (32P0768)
0GB	Standard in base model					
18.2GB	-	-	-	1	-	-
36.4GB	1	-	-	2	1	-
54.6GB	-	-	-	3	-	-
72.8GB	2	-	-	4	2	-
73.4GB	-	1	-	-	-	1
91GB	-	-	-	5	-	-
109.2GB	3	-	-	6	3	-
127.4GB	-	-	-	7	-	-
145.6GB	4	-	-	8	4	-
146.8GB	-	2	1	-	-	2
163.8GB	-	-	-	9	-	-
182GB	5	-	-	10	5	-
200.2GB	-	-	-	11	-	-
218.4GB	6	-	-	12	6	-
220.2GB	-	3	-	-	-	3
236.6GB	-	-	-	13	-	-
254.8GB	7	-	-	14	7	-
291.2GB	8	-	-	-	8	-
293.6GB	-	4	2	-	-	4
327.6GB	9	-	-	-	9	-
364GB	10	-	-	-	10	-
367GB	-	5	-	-	-	5
400.4GB	11	-	-	-	11	-
436.8GB	12	-	-	-	12	-
440.4GB	-	6	3	-	-	6
473.6GB	13	-	-	-	13	-
510GB	14	-	-	-	14	-
513.8GB	-	7	-	-	-	7
587.2GB	-	8	4	-	-	8
660.6GB	-	9	-	-	-	9
734GB (max)	-	10	5	-	-	10
807.4GB	-	11	-	-	-	11
880.8GB	-	12	6	-	-	12
954.2GB	-	13	-	-	-	13
1027.6GB	-	14	7	-	-	14
1174.4GB	-	-	8	-	-	-
1321.2GB	-	-	9	-	-	-
1468GB	-	-	10	-	-	-
1614.8GB	-	-	11	-	-	-
1761.6GB	-	-	12	-	-	-
1908.4GB	-	-	13	-	-	-
2055.2GB	-	-	14	-	-	-

This table does not represent all possible HDD configurations.

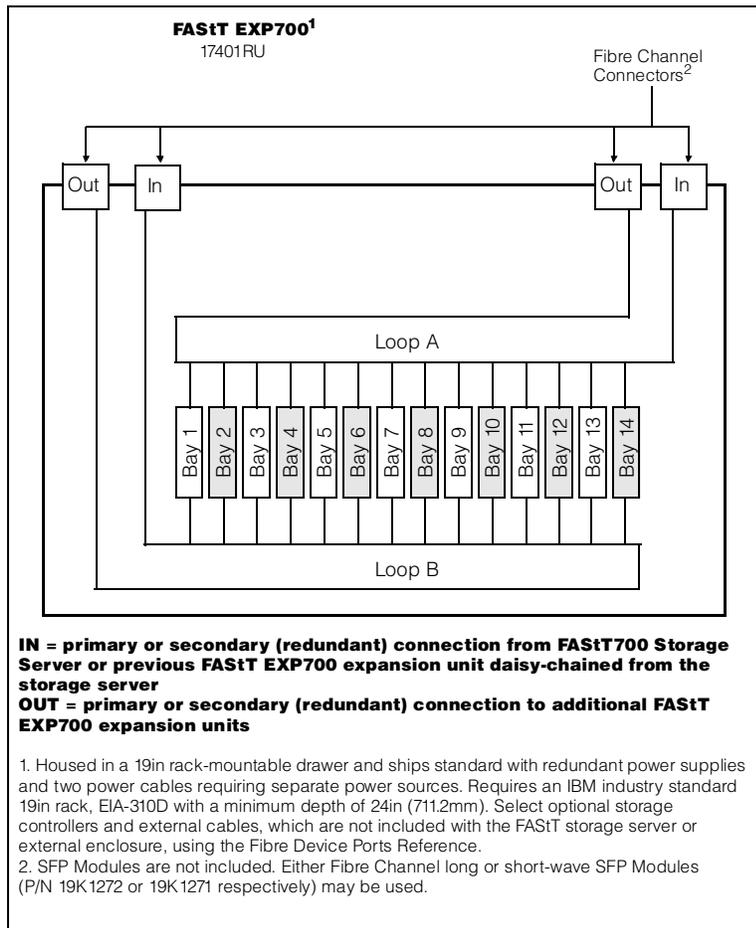
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice.

IBM FAStT EXP700



Part Number	Description	RPM	Height	Bays Supported	Maximum Quantity
06P5761	2Gbps FC 36.4GB/10K Drive	10,000	SL	1 ... 14	14
06P5762	2Gbps FC 73.4GB/10K Drive	10,000	SL	1 ... 14	14
32P0765	146.8GB Fibre Channel Disk Drive Module	10,000	SL	1 ... 14	14
06P5771	2Gbps FC 18.2GB/15K Drive	15,000	SL	1 ... 14	14
06P5772	2Gbps FC 36.4GB/15K Drive	15,000	SL	1 ... 14	14
32P0768	73.4GB/15K Disk Module	15,000	SL	1 ... 14	14
External Storage Expansion Units		Form Factor			
17401RU	FAST EXP700 Storage Expansion Unit <sup>1</sup>	Rack (3U)			

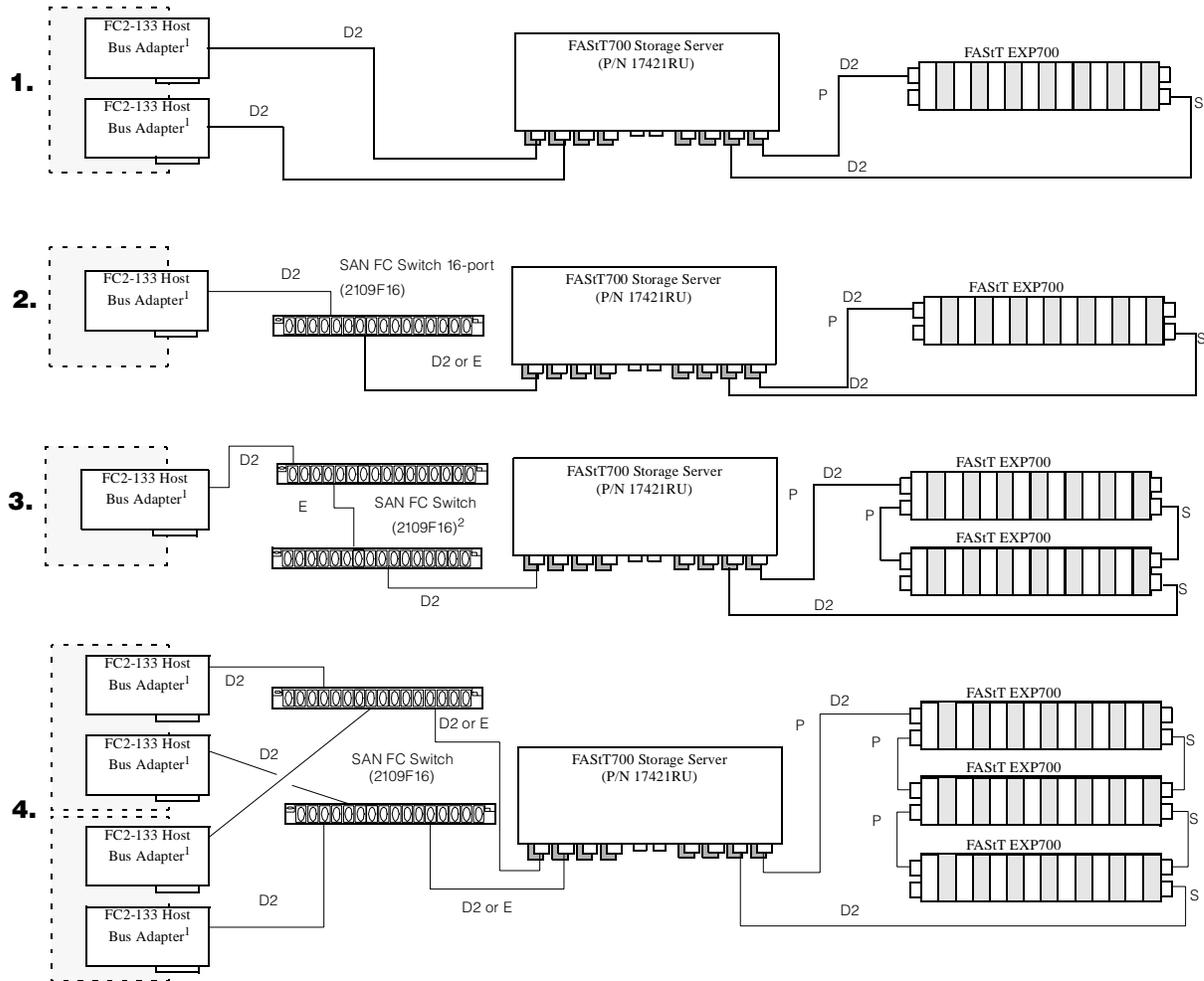
1. The FAST EXP700 includes two hot-swap, 400w auto-ranging redundant power supplies, each with its own power cord.



## Fibre / Fibre Configuration Examples

### FASTt EXP700 with FASTt700 Fibre Channel Storage Server

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



1. FC2-133 Host Bus Adapter (P/N 24P0960) includes an integrated short-wave SFF Module, supporting short-wave connections only.
2. Buffering the long-wave optic cable expanse with a second switch or hub at the remote storage location is required to requalify the signal.

- P = primary path, S = secondary (redundant) path.
- Shaded boxes represent separate hosts.
- Cable groups are represented by letters in parenthesis.
- A maximum of 224 external storage HDDs are supported through a maximum of eight enclosures in a redundant loop (cable pair). The maximum number of enclosures supported is 16. A maximum of two loops running in redundant mode are supported with four drive-side mini hubs.
- The number of servers that can be used in configurations with managed hubs or Fibre Channel switches are dependent on partitioning restrictions of the management system or cluster software.
- An optional short- or long-wave SFP Module is required for all FASTt EXP700 storage connections. FASTt700 and 2Gb Fibre Channel switch connections require SFP Modules. SFP Modules and adapter cables are not depicted in these diagrams. See device drawings at the end of this section for details.
- For specific requirements concerning connections, refer to the Fibre Device Ports Reference or Fibre Interconnection Guidelines.

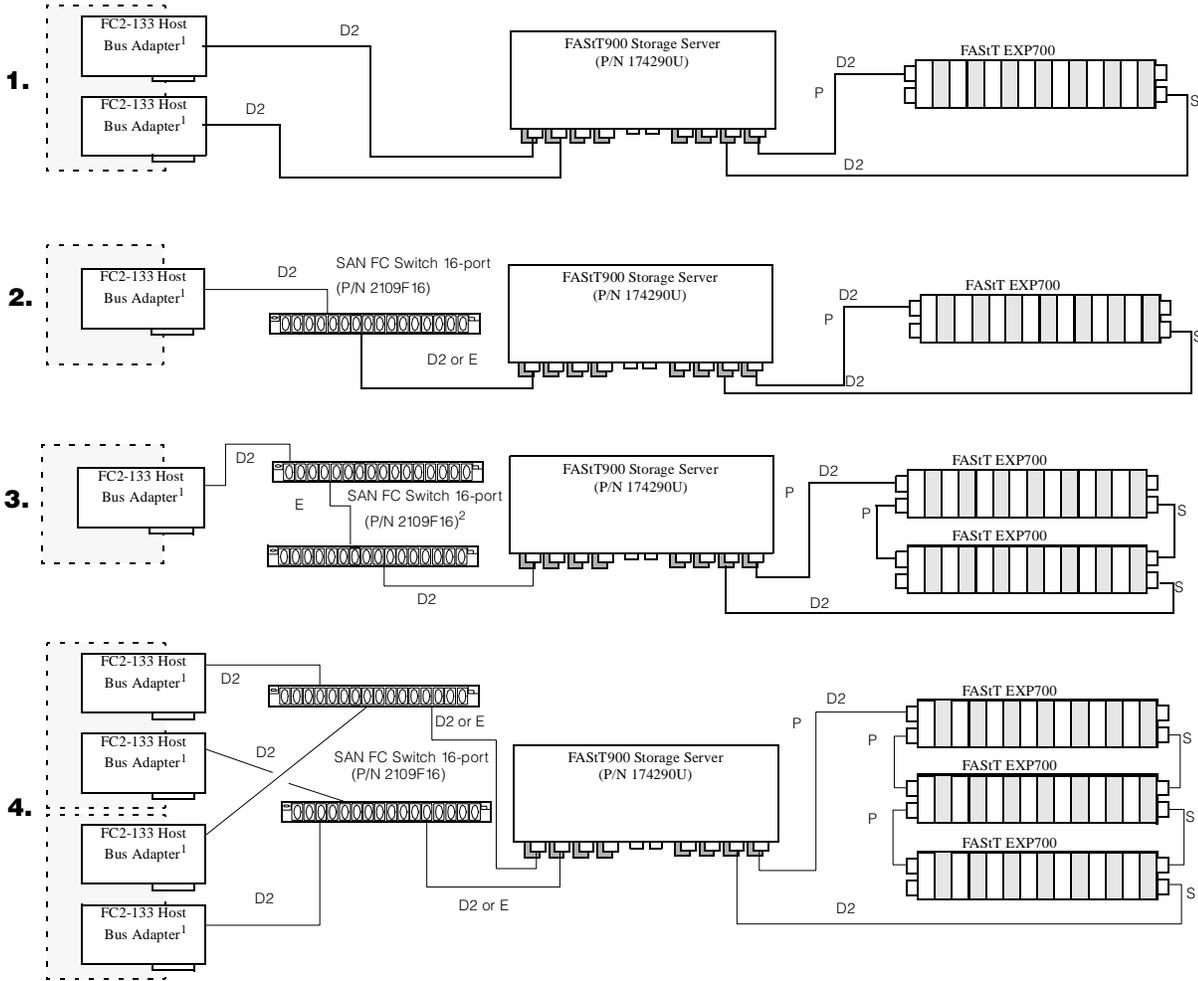
**Refer to the Supported Cable Groups chart following the FASTt 200 configuration examples for cable type definitions.**



## Fibre / Fibre Configuration Examples

### FAST EXP700 with FAST900 Fibre Channel Storage Server

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



1. FC2-133 Host Bus Adapter (P/N 24P0960) includes an integrated short-wave SFF Module, supporting short-wave connections only.
2. Buffering the long-wave optic cable expanse with a second switch or hub at the remote storage location is required to requalify the signal.

- P = primary path, S = secondary (redundant) path.
- Shaded boxes represent separate hosts.
- Cable groups are represented by letters in parenthesis.
- A maximum of 224 external storage HDDs are supported in a maximum of eight enclosures in a redundant loop (cable pair). The maximum number of enclosures supported is 16. A maximum of two loops running in redundant mode are supported with four drive-side mini hubs.
- The number of servers that can be used in configurations with managed hubs or Fibre Channel switches are dependent on partitioning restrictions of the management system or cluster software.
- An optional short- or long-wave SFP Module is required for all FAST EXP700 storage connections. FAST900 and 2Gb Fibre Channel switch connections require SFP Modules. SFP Modules are not depicted in these diagrams. See device drawings at the end of this section for details.
- For specific requirements concerning connections, refer to the Fibre Device Ports Reference or Fibre Interconnection Guidelines.

**Refer to the Supported Cable Groups chart following the FAST 200 configuration examples for cable type definitions.**

## Fibre Interconnection Guidelines

Part Number	Description	00N6881 FASTT Host Adapter	00N6882 FASTT Mini Hub <sup>1</sup>	24P0960 FC2-133 Host Bus Adapter	19K1121 FASTT200 Redundant RAID Controller <sup>1</sup>	2109R3L SAN Data Gateway Router	35421RU FASTT200 Storage Server <sup>1</sup>	35422RU FASTT200 HA Storage Server <sup>1</sup>	35521RU FASTT500 Storage Server <sup>1</sup>	35601RU FASTT EXP500 <sup>1</sup>	3534F08 TotalStorage SAN Switch Pkg. 8-Port <sup>2</sup>	2109F16 SAN Fibre Channel <sup>1</sup> Switch, 16-port <sup>2</sup>	17421RU FASTT700 FC Storage Server-2 Hub <sup>2</sup>	19K1269 FASTT Mini EXP700 <sup>2</sup>	174290U FASTT900 Fibre Channel Storage Server <sup>2</sup>	19K1250 LC-SC Fibre Channel Adapter Cable <sup>6</sup>	
00N6881	FASTT Host Adapter	-	S	-	S	-	S	S	S	-	S <sup>7</sup>	S <sup>7</sup>	S <sup>7</sup>	S <sup>7</sup>	-	S <sup>7</sup>	H
24P0960	FC2-133 Host Bus Adapter	-	S <sup>8</sup>	-	S <sup>8</sup>	-	S <sup>8</sup>	S <sup>8</sup>	S <sup>8</sup>	-	S	S	S	S	-	S	H
2108R3L	SAN Data Gateway Router UltraSCSI LVD Port	-	-	-	-	-	-	-	-	-	S <sup>7</sup>	S <sup>7</sup>	-	-	-	-	H
3534F08	SAN Fibre Channel Switch, 8-port <sup>2, 4</sup>	S	E <sup>8</sup>	S	E <sup>8</sup>	S <sup>8</sup>	E <sup>8</sup>	E <sup>8</sup>	E <sup>8</sup>	-	E	E	E	E	-	E	H
2109F16	SAN Fibre Channel Switch, 16-Port <sup>2, 5</sup>	S	E <sup>8</sup>	S	E <sup>8</sup>	S <sup>8</sup>	E <sup>8</sup>	E <sup>8</sup>	E <sup>8</sup>	-	E	E	E	E	-	E	H
35421RU	FASTT200 Storage Server <sup>1</sup>	S	-	S <sup>8</sup>	H	-	-	-	-	E	E	E	-	-	E	-	H
35422RU	FASTT200 HA Storage Server <sup>1</sup>	S	-	S <sup>8</sup>	-	-	-	-	-	E	E	E	-	-	E	-	H
19K1121	FASTT200 Redundant RAID Controller <sup>1</sup>	S	-	S <sup>8</sup>	-	-	H	-	-	E	-	-	-	-	-	-	H
35521RU	FASTT500 Storage Server <sup>1</sup>	-	H	S <sup>8</sup>	-	-	-	-	-	E	-	-	-	-	-	-	H
00N6882	FASTT500 Mini Hub <sup>1</sup>	-	E	S <sup>8</sup>	E	-	-	H	E	-	-	-	-	-	-	-	H
35601RU	FASTT EXP500 Storage Expansion Unit <sup>1</sup>	-	E	-	E	-	E	E	E	-	-	-	E <sup>7</sup>	E <sup>7</sup>	-	E <sup>7</sup>	H
17421RU	FASTT700 Fibre Channel Storage Server <sup>2</sup>	S <sup>8</sup>	-	S	-	-	-	-	-	E <sup>8</sup>	E	E	-	H	E	-	H
19K1269	FASTT700 Mini Hub <sup>2</sup>	S <sup>8</sup>	-	S	-	-	-	-	-	E <sup>8</sup>	E	E	H	-	E	H	H
17401RU	FASTT EXP700 Storage Expansion Unit <sup>2</sup>	-	-	S	-	-	-	-	-	-	-	-	E	E	-	E	-
174290U	FASTT900 Storage Server (US line cord) <sup>3</sup>	S <sup>8</sup>	-	S	-	-	-	-	-	E <sup>8</sup>	E	E	-	H	E	-	H
03K9307	FC Long-wave GBIC	-	H	-	H	-	H	H	H	H	-	-	-	-	-	-	H
03K9308	FC Short-wave GBIC	-	H	-	H	-	H	H	H	H	-	-	-	-	-	-	H
19K1250	LC-SC Fibre Channel Adapter Cable <sup>6</sup>	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-
19K1271	Short-wave SFP Module	-	-	-	-	-	-	-	-	-	H	H	H	H	H	H	H
19K1272	Long-wave SFP Module	-	-	-	-	-	-	-	-	-	H	H	H	H	H	H	H
48P7062	BladeCenter 2-port Fibre Channel Switch Module <sup>9</sup>	-	E	-	E	-	E	E	E	-	-	-	E	E	-	E	H

- S** Short-wave connection only. See Fibre Device Ports Reference section for GBIC, SFP module or integrated optical port information.
  - E** Either short-wave or long-wave connections allowed via the appropriate GBIC or SFP module. See Fibre Device Ports Reference section for GBIC, SFP module or integrated optical port information.
  - H** Hardware connection: One of these devices installs directly into the other, e.g., the FASTT500 Mini Hub (P/N 00N6882) installs directly into the FASTT500 Storage Server (P/N 35521RU) to provide GBIC availability.
1. This device requires the use of GBICs. Purchase of GBICs may be needed in order to make connections to this device. See the Fibre Device Ports Reference section for GBIC or integrated optical port information.
  2. This device requires a long- or short-wave SFP module. See Fibre Device Ports Reference for additional information.
  3. This device requires a long- or short-wave SFP module. See Fibre Device Ports Reference for additional information. Additional options include FlashCopy Activation (P/N 24P7985), Remote Mirror Activation (P/N 24P7986), Upgrade from 16 to 64 Storage Partitions (P/N 24P7984) and Host Kits for AIX, Sun and HP servers (P/N 24P7981, 24P7982, 24P7983).
  4. Additional related options include F08 Full Fabric Activation (P/N 18P5060) and Performance Bundle Activation (P/N 18P4405).
  5. Additional related options include Remote Switch Activation (P/N 18P3536), Extended Fabric Activation (P/N 18P3580) and F16 Performance Bundle Activation (P/N 18P3590). Power cords for nonrack installation are available by country.
  6. The LC-SC Fibre Channel Adapter Cable (P/N 19K1250) is designed to connect any 1Gb device or cable to any 2Gb device or cable. When 2Gb and 1Gb technology are combined in a configuration, the signal transfer automatically converts to the slower speed.
  7. When connected to 2Gb devices or cable, LC-SC Fibre Channel Adapter Cable (P/N 19K1250) is required.
  8. When connected to 1Gb devices or cable, LC-SC Fibre Channel Adapter Cable (P/N 19K1250) is required.
  9. Compatible only with BladeCenter. Supports two SFP modules (either short- or long-wave).





## Fibre Device Ports Reference

Part Number	Description	Total Connections Possible	Integrated Ports <sup>5</sup>	Mini Hubs Possible	Mini Hubs Installed	GBIC or SFP Module Ports	GBICs or SFP Modules Included <sup>5</sup>
00N6881	FAST Host Adapter	1	1	-	-	-	-
00N6882	FAST500 Mini Hub <sup>1</sup>	2	-	-	-	2	-
03K9307	FC Long-wave GBIC	1	-	-	-	-	-
03K9308	FC Short-wave GBIC	1	-	-	-	-	-
19K1121	FAST200 Redundant RAID Controller	2	-	-	-	2	-
2108R3L	San DataGateway Router UltraSCSI LVD Port <sup>2</sup>	1	1	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port <sup>3</sup>	8	-	-	-	8	4 <sup>11</sup>
2109F16	SAN FC Switch, 16-Port <sup>4</sup>	16	-	-	-	16	8 <sup>12</sup>
35421RU	FAST200 Storage Server	2	-	-	-	2	-
35422RU	FAST200 HA Storage Server	4	-	-	-	4	-
35521RU	FAST500 Storage Server <sup>6</sup>	12	-	8	4	12 <sup>1</sup>	-
35601RU	FAST EXP500 Storage Expansion Unit	4	-	-	-	4	-
24P0960	FC2-133 Host Bus Adapter	1	1	-	-	-	-
17421RU	FAST700 FC Storage Server <sup>7</sup>	12	-	8	4	12	-
19K1269	FAST700 Mini Hub <sup>8</sup>	2	-	-	-	2	-
17401RU	FAST EXP700 Storage Expansion Unit	4	-	-	-	4	-
174290U	FAST900 Storage Server (US line cord) <sup>9</sup>	12	-	8	4	12	-
19K1250	LC-SC FC Adapter Cable <sup>10</sup>	1	1	-	-	-	-
19K1271	Short-wave SFP Module	1	-	-	-	-	-
19K1272	Long-wave SFP Module	1	-	-	-	-	-
48P7062	BladeCenter 2-port Fibre Channel Switch Module <sup>13</sup>	2	-	-	-	2	-

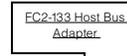
1. Each FAST500 Mini Hub provides two GBIC ports. The host-side mini hubs connect to one of two Fibre Channel controllers in the FAST500 Storage Server. The drive-side mini hubs each connect to both Fibre Channel controllers. Full redundancy requires connection to two drive-side and two host-side mini hubs. Drive-side mini hubs support connection to one port only.
2. Provides one integrated short-wave optical port and two SCSI ports for tape storage connections (one LVD or HVD and one single-ended).
3. Additional related options include F08 Full Fabric Activation (P/N 18P5060) and Performance Bundle Activation (P/N 18P4405).
4. Additional related options include Remote Switch Activation (P/N 18P3536), Extended Fabric Activation (P/N 18P3580) and F16 Performance Bundle Activation (P/N 18P3590). Power cords for nonrack installation are available by country.
5. Standard GBICs, SFP Modules and integrated optical ports are short-wave.
6. FAST500 Storage Server supports up to eight nonredundant or four redundant host connections and two redundant storage drive loops.
7. FAST700 Storage Server supports up to eight nonredundant or four redundant host connections and two redundant storage drive loops.
8. Each FAST700 Mini Hub provides two SFP Module ports. The host-side mini hubs connect to one of two Fibre Channel controllers in the FAST700 or FAST900 Storage Servers. The drive side mini hubs each connect to both Fibre Channel controllers. Full redundancy requires connection to two drive-side and two host-side mini hubs. Drive-side mini hubs support connection to one port only.
9. FAST900 Storage Server supports up to eight nonredundant or four redundant host connections and two redundant storage drive loops. Additional options include FlashCopy Activation (P/N 24P7985), Remote Mirror Activation (24P7986), Upgrade from 16 to 64 Storage Partitions (P/N 24P7984) and Host Kits for AIX, Sun and HP servers (P/N 24P7981, 24P7982, 24P7983).
10. The LC-SC Fibre Channel Adapter Cable (P/N 19K1250) is designed to connect any 1Gb device or cable to any 2Gb device or cable. When 2Gb and 1Gb technology are combined in a configuration, the signal transfer automatically converts to the slower speed.
11. Four short-wave SFP modules are standard. Either short-wave or long-wave modules can populate the other four ports.
12. Eight short-wave SFP modules are standard. Either short-wave or long-wave modules can populate the other eight ports.
13. Compatible only with BladeCenter. Supports two SFP modules (either short- or long-wave).

### FAST Host Adapter (P/N 00N6881)



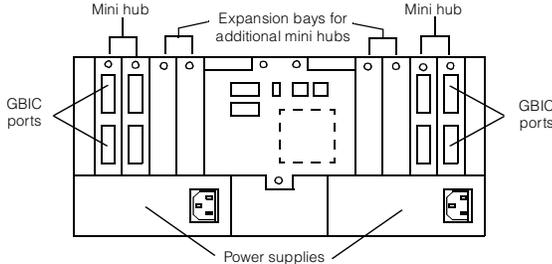
- PCI to FCAL 64/32-bit host adapter.
- Compatible with Cable Group D1.
- Integrated short-wave optical port, no GBIC required.
- Full Fibre Channel fabric support.

### FC2-133 Host Bus Adapter (P/N 24P0960)



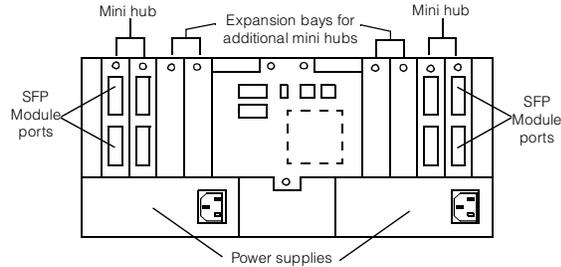
- PCI-X to FCAL 64-bit host adapter (133Mhz).
- Supported Attachments (use LC-LC cable in group D2): FAST700 Storage Server (P/N 17421RU).
- Integrated short-wave optical port, no SFP Module required.
- Full Fibre Channel fabric support.

### FAST500 Storage Server (P/N 35521RU)



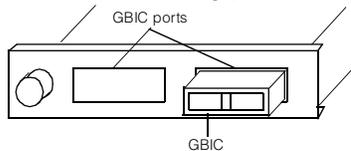
- Dual high-performance RAID controller cards — supports up to 380MB/sec of throughput.
- Two 175w auto-ranging, hot-swap redundant power supplies.
- Attach directly to FAST Host Adapter(s) (P/N 00N6881) with short-wave cables and GBICs or indirectly through SAN Fibre Channel Managed Hub (P/N 35341RU) or either the 8-port or 16-port Fibre Channel Switch (P/N 2109S08, 2109S16) using cables from cable group D1 or E with corresponding GBICs.
- Height is 4U (1U = 1.75in or 44.45mm).
- For optimum performance no more than two FAST500 Storage Servers (P/N 35521RU) should be attached to a single hub (P/N 35341RU).
- Includes four FAST500 Mini Hubs (P/N 00N6882), two for host and two for drive-side.
- FAST500 256MB Cache (P/N 00N6883) may be required for more complex installations.
- All connections to FAST500 Mini Hubs require the use of GBICs. GBICs are not included.

### FAST700 Storage Server (P/N 17421RU)



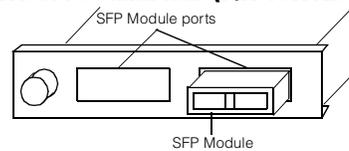
- Dual high-performance RAID controller cards — supports up to 390MB/sec of throughput.
- Operates at 1Gb or 2Gb (autosensing).
- Dual 175w auto-ranging, hot-swap redundant power supplies.
- Attach directly to FC2-133 Host Bus Adapter (P/N 24P0960) with short-wave cables and SFP Modules or indirectly through either the 8-port or 16-port 2Gb Fibre Channel Switch (P/N 3534F08, 2109F16) using cables from cable group D2 or E with corresponding SFP Modules.
- Height is 4U (1U = 1.75in or 44.45mm).
- For optimum performance no more than two FAST700 Storage Servers (P/N 17421RU) should be attached to a single Fibre Channel switch.
- Includes four FAST700 Mini Hubs (P/N 19K1269), two host-side and two storage drive-side.
- Each controller is equipped with 1GB of cache (2GB total).
- All connections to FAST700 Mini Hubs require the use of SFP Modules, which are not included.

### FAST500 Mini Hub (P/N 00N6882)



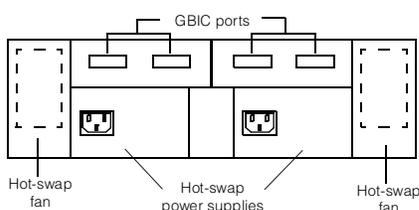
- Provides additional connections to the FAST Storage Server — supports complex clustering or advanced storage applications.
- All connections to FAST500 Mini Hubs require the use of GBICs. GBICs are not included.

### FAST700 Mini Hub (P/N 19K1269)



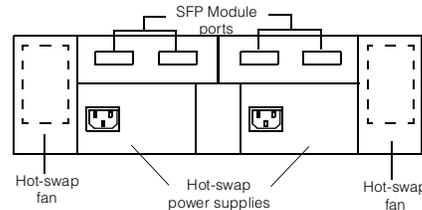
- Provides additional connections to the FAST Storage Server — supports complex clustering or advanced storage applications.
- All connections to FAST700 Mini Hubs require the use of SFP Modules. SFP Modules are not included.

### FAST EXP500 Storage Expansion Unit (P/N 35601RU)



- Two hot-swap, 350w auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over-temperature, and other abnormalities.
- Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap HDDs.
- Height is 3U (1U = 1.75in or 44.45mm).
- Requires optional GBICs for each connection. GBICs not included.

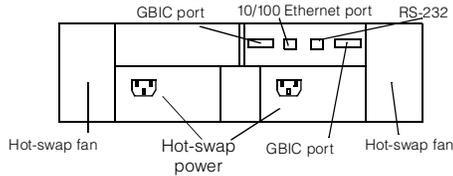
### FAST EXP700 Storage Expansion Unit (P/N 17401RU)



- Two hot-swap, 400w auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over-temperature, and other abnormalities.
- Fourteen drive bays - supports slim-high Fibre Channel hot-swap HDDs.
- Height is 3U (1U = 1.75in or 44.45mm).
- Requires optional SFP Modules for each connection. SFP Modules not included.

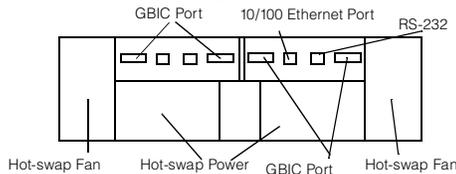


### FASTt200 Storage Server (P/N 35421RU)



- Contains a single hot-plug RAID controller which provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
- Can be upgraded to a FASTt200 HA Storage Server through the addition of a FASTt200 Redundant RAID Controller (P/N 19K1121).
- Integrated 10/100Mbps Ethernet connector and RS-232 service support port.
- Two hot-swap 350W auto-ranging, redundant power supplies.
- Redundant fans: two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over-temperature, and other abnormalities.
- Ten drive bays - supports slim-line or half-high Fibre Channel hot-swap HDDs.
- Height is 3U (1U=1.75in or 44.45mm).
- Supports long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

### FASTt200 HA Storage Server (P/N 35422RU)



- Contains two hot-plug RAID controllers. Each controller provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
- Integrated 10/100Mbps Ethernet connector and RS-232 service support port.
- Performance optimized for 60 HDDs - supports optional FASTt EXP500 Storage Expansion Units (P/N 35601RU).
- Two hot-swap 350W auto-ranging, redundant power supplies.
- Redundant fans: two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over-temperature, and other abnormalities.
- Ten drive bays - supports slim-line or half-high Fibre Channel hot-swap HDDs.
- Height is 3U (1U=1.75in or 44.45mm).
- Supports long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

### SAN Fibre Channel Switch, 8-port (P/N 3534F08)



- Provides 2Gb per second port-to-port throughput with autosensing capability for connecting to 1Gb per second host servers, storage and switches with full operability.
- Contained in a 1U mechanical.
- Includes a comprehensive set of management tools that support a Web browser interface.
- Four short-wave SFP Modules (optical transceivers) are standard.
- Supports up to 192 ports in a single 42U rack (scalable to 239 switches maximum).
- Additional related options include F08 Full Fabric Activation (P/N 18P5060) and Performance Bundle Activation (P/N 18P4405).

### SAN Fibre Channel Switch, 16-port (P/N 2109F16)



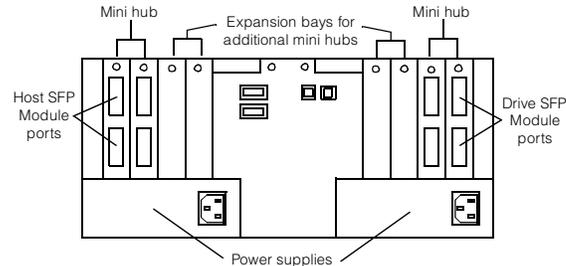
- Provides 2Gb per second port-to-port throughput with autosensing capability for connecting to 1Gb per second host servers, storage and switches with full operability.
- Contained in a 1U mechanical, requiring half the rack space of the 1Gb 16-port switch.
- Up to four Inter-Switch Links can be trunked for throughput of up to 8Gb per second.
- Includes a comprehensive set of management tools that support a Web browser interface.
- Eight short-wave SFP Modules (optical transceivers) are standard.
- Built-in redundancy with no single points of failure.
- Supports up to 384 ports in a single 42U rack (scalable to 239 switches maximum).
- Ships with one hot-swap 126W power supply, and supports an optional redundant power supply (P/N 18P3576).
- Additional related options include Remote Switch Activation (P/N 18P3576), Extended Fabric Activation (P/N 18P3580) and F16 Performance Bundle Activation (P/N 18P3590). Power cords for nonrack installation are available by country.

### LC-SC Fibre Channel Adapter Cable (P/N 19K1250)



- Nine-inch adapter cable used to connect 1Gb cable or devices to 2Gb cable or devices.
- Remove the clip-on connector (B) at one end and plug into the FASTt Host Adapter integrated GBIC (or any short-wave GBIC). Use the double-female 2Gb-2Gb open connector that ships with the FASTt700 Storage Server to attach the male connector of LC-LC Fibre Channel cable to the male connector at the other end of the adapter cable (A).
- Use the 2Gb connector (A) to attach to an SFP or SFF Module, then remove the black caps from the clip-on connector and insert 1Gb cable.

### FASTt900 Storage Server (P/N 174290U)



- Dual high-performance RAID controller cards supporting up to 772MB/sec of throughput.
- Operates at 1Gb or 2Gb (autosensing).
- Dual 175w auto-ranging, hot-swap, redundant power supplies.
- Attach directly to FC2-133 Host Bus Adapter (P/N 24P0960) with short-wave cables and SFP Modules or indirectly through the SAN Fibre Channel Switch, 16-port (P/N 2109F16) or TotalStorage SAN Switch F08, 8-port (P/N 3534F08) using LC-LC cables from cable group D2 or E with corresponding SFP Modules.
- Height is 4U (1U = 1.75in or 44.45mm).
- For optimum performance no more than two FASTt900 Storage Servers (P/N 174290U) should be attached to a single Fibre Channel switch.
- Includes four FASTt700 Mini Hubs (P/N 19K1269), two host-side and two storage drive-side.
- Each controller is equipped with 1GB of cache (2GB total).
- All connections to FASTt700 Mini Hubs require the use of SFP Modules, which are not included.



# IBM Rack Cabinets and Options

## EMEA Part Number Cross Reference

NetBAY Rack Cabinets				
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE
9306110	9306110	---	NetBAY 11	---
9306250	9306250	---	NetBAY 25 Standard Rack	---
9306420	9306420	---	NetBAY 42 Standard Rack	---
9306421	9306421	---	NetBAY 42 Expansion	---
930842S	930842S	---	NetBAY 42 Enterprise Standard Rack	---
930842E	930842E	---	NetBAY 42 Enterprise Expansion	---

Rack Options					
EMEA P/N	AMERICAS P/N	M/C TYPE MODEL	DESCRIPTION	EMEA WDFM DATE	
Note 1	28L36xx	28L3644	---	Spacesaver II Keyboard	---
Note 2	T3147xx	633147N	6331-47N	E54 15" (13.8" viewable image) Colour Monitor (S/Black)	---
Note 2	T3247xx	63324HN	6332-4HN	E74 17" (16" viewable image) Colour Monitor (S/Black)	---
	N/A	32P1031	---	NetBAY 1U Flat Panel Monitor Console Kit (with US keyboard)	---
	N/A	32P1702	---	NetBAY 2U Flat Panel Monitor Console Kit (with US keyboard)	---
Note 3	37L68xx	37L6866	---	NetBAY Rack PDU	---
Note 4	37L68xx	37L6865	---	NetBAY Server Dual-Cord PDU	---
	37L6885	37L6884	---	NetBAY 200-240V Single-Phase Front-End PDU	---
	37L6887	37L6886	---	NetBAY Three-Phase Front-End PDU	---
Note 5	32P16xx	32P1020	---	APC 2U Smart-UPS 1400RMiB	---
Note 6	32P1681	2130R30	---	UPS3000XLV	---
Note 7	32P16xx	2130R31	---	UPS3000XHV	---
	37L6862	37L6861	---	APC Smart-UPS 5000RMiB	---
	94G7448	94G6667	---	Rack Power Cord	---

1. Where 'xx' represents a specific country code as follows:- 46=Danish , 47=French, 48=German, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Swiss, 19K3832=Swedish/Finnish, 19K3833=Portugese, 19K3834=Belgian, 19K3836=Russian, 19K3837=Polish.

2. Where 'xx' represents a specific country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa/Pakistan, CH=Switzerland, UK=UK, EU=Europe.

3. Where 'xx' represents a specific country code as follows: 66=US/Saudi Arabia, 68=EU, 70=Denmark/Switzerland, 72=Israel, 74=Italy, 76=South Africa, P/N 06P6028=UK.

4. Where 'xx' represents a specific country code as follows: 65=US/Saudi Arabia, 67=EU, 69=Denmark/Switzerland, 71=Israel, 73=Italy, 75=South Africa, P/N 06P6027=UK.

5. Where 'xx' represents a specific country code as follows:- 12=Europe, 13=UK, 14=Italy, 15=Switzerland, 16=Denmark, 17=South Africa, 18=Israel.

6. Only available in Saudi Arabia.

7. Where 'xx' represents a specific country code as follows:- 84=Europe, 85=UK, 86=Italy, 87=Swiss, 89=South Africa, 90=Israel, 91=Saudi Arabia.



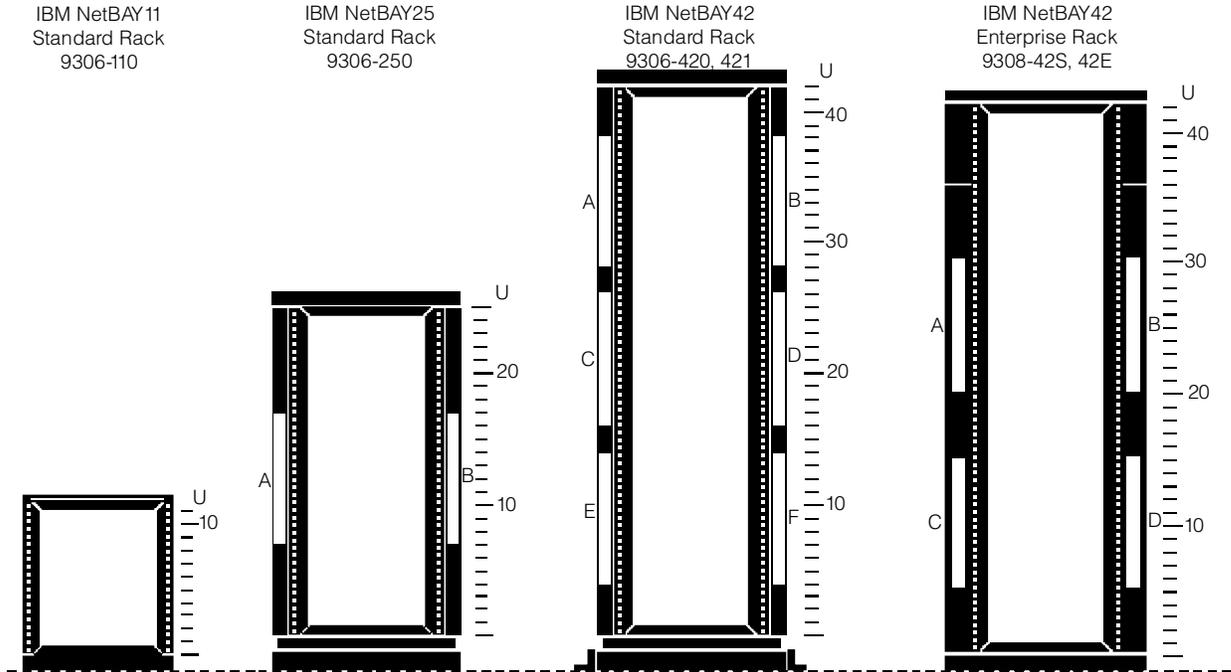
# IBM Rack Cabinets and Options

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# Rack Cabinets and Options



	<b>IBM NetBAY11 Standard Rack</b>	<b>IBM NetBAY25 Standard Rack<sup>3</sup></b>	<b>IBM NetBAY42 Standard Rack</b>		<b>IBM NetBAY42 Enterprise Rack</b>	
<b>Machine Type / Model</b>	9306110	9306250	9306420	9306421	930842S	930842E
EIA Capacity <sup>1</sup>	11U	25U	42U	42U	42U	42U
Sidewall Compartments	0	2	6	6	4	4
Front Stabilizers	Std	Std	Std	Std	Std	Std
Side Stabilizers	NR	NR	Std	Std	NR	NR
Casters	Std	Std	Std	Std	Std	Std
Leveling Feet	NA	Std	Std	Std	Std	Std
Side Covers	Std	Std	Std	NR	Std	NR
Rack Attachment Kit <sup>2</sup>	NA	NA	NR	Std	NR	Std
Glass Front Door	NA	NA	NA	NA	NA	NA
Perforated Front Door	Std	Std	Std	Std	Std	Std
Perforated Rear Door	NA	Std	Std	Std	Std	Std
Height (mm/in) <sup>4</sup>	611 / 24.1	1360 / 53.5	2076 / 81.7	2076 / 81.7	2020 / 79.5	2020 / 79.5
Width (mm/in)	518 / 20.4	600 / 23.6	600 / 23.6	600 / 23.6	648 / 25.5	648 / 25.5
Depth (mm/in)	873 / 34.4	1000 / 39.4	1000 / 39.4	1000 / 39.4	1105 / 43.5	1105 / 43.5
Empty Weight (kg/lb)	34 / 75	80 / 177	117 / 258	92 / 202	261 / 575	234 / 516
Max Load (kg/lb)	182 / 401	385 / 849	646 / 1424	646 / 1424	667 / 1470	667 / 1470
Total Weight (kg/lb)	216 / 476	465 / 1026	763 / 1682	738 / 1626	928 / 2045	901 / 1986
Shippable Loaded <sup>5</sup>	Yes	Yes	No	No	Yes	Yes

NR - Not Required      NA - Not Available      1U=1.75in (44.5mm)

1. Conforms to EIA 310 - D Standard 19in rack specification for a Type A cabinet with universal hole spacing.
2. Required to attach racks together to make a suite.
3. Display and keyboard may be placed on top of the NetBAY25.
4. Minimum clearance to the ceiling is 305mm / 12in.
5. 'Shippable loaded' means the cabinet is capable of being transported with equipment installed. Required packaging is provided. The integrator/ assembler is responsible for assuring the stability of the shipped configuration. Rack Integration Services are available from IBM.



Server System Rack Alternatives												
Servers	Conversion Kits						Standard Racks <sup>1</sup>				Enterprise Racks <sup>1</sup>	
	09N4300 4Ux20D Tower-to-Rack Kit	59P4817 4U Extended Depth Tower-to-Rack Conversion Kit	59P4211 5Ux24D Tower-to-Rack Kit III	32P1474 7Ux26D Tower-to-Rack Kit	37L6859 8Ux24D Tower-to-Rack Kit	37L6860 8Ux24D Rack-to-Tower Kit	9306-110 NetBAY11	9306-250 NetBAY25SR	9306-420 NetBAY42SR	9306-421 NetBAY42SX	9308-42S NetBAY42ER	9308-42E NetBAY42EX
xSeries 205 <sup>2</sup>	X						X	X	X	X	X	X
xSeries 225 <sup>2</sup>		X					X	X	X	X	X	X
xSeries 235			X				X	X	X	X	X	X
xSeries 255				X			X	X	X	X	X	X
xSeries 305 <sup>3</sup>							X	X	X	X	X	X
xSeries 335							X	X	X	X	X	X
xSeries 345							X	X	X	X	X	X
xSeries 360							X	X	X	X	X	X
xSeries 440							X	X	X	X	X	X
BladeCenter							X	X	X	X	X	X

1. See the first page of Rack Cabinets and Options section for additional information concerning IBM rack-supported devices.

2. Rack installation requires appropriate conversion kit.

3. Blank filler panels (P/N 94G6670) should be placed on the front of any unused rack space to aid proper airflow through the system units. If non-IBM racks are used, assure that both the front and rear doors offer a minimum of 45% open area uniformly distributed and in line with the installed servers. A clearance of at least 51mm (2in) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Nonrack installations are not supported.



IBM Rack-Mounted Units												
Description	Machine Type / Model	Size (U) <sup>8</sup>	Depth (in) <sup>9</sup>	Approx Weight (lbs)	Power (Watts) Typical/Max (All cords to same source)	Number of P/S and Line Cords basic/max	Standard Power Cords <sup>10</sup>					
							6ft NEMA 5-15P P/N 6952301	9ft NEMA 5-15P P/N 6952300	9ft NEMA 6-15P P/N 1838574	5ft IEC 320-C14 P/N 36L8860	9ft IEC 320-C14 P/N 36L8886	14ft IEC 320-C14 P/N 36L8861
<b>Server System Units:</b>												
x205 <sup>1</sup>	8480	4	20	43	340/485	1/1	1					
x225 <sup>2</sup>	8647	4	26	57	420/600	1/1	1					
x225 w/redundant power <sup>2</sup>	8647	4	26	57	350/500	2/2	2					
x235 <sup>3</sup>	8671	5	24	83	560/800	1/2	1					
x255 <sup>4</sup>	8685	7	25	120	530/1000	2/2 <sup>11</sup>		2			2	
x305 <sup>b</sup>	8673	1	17	28	140/200	1/1		1			1	
x335 <sup>b</sup>	8676	1	26	29	245/340	1/1		1			1	
x345	8670	2	29	62	350/500	1/2		1			1	
x360	8686	3	28	62	520/740	1/3		2			2	
x440 <sup>c</sup>	8687	4	28	120	800/950	2/2			2		2	
BladeCenter w/2 power supplies	8677	7	28	134	1050/1500	2/2					2	
BladeCenter w/4 power supplies	8677	7	28	230	2100/3000	4/4					4	
<b>I/O Units:</b>												
RXE-100	86841RU	3	26	56	260/370	2/2		2			2	
<b>Storage Units:</b>												
EXP300	35311RU	3	21	90	285/360	2/2		2				
FASiT200	35421RU	3	22	56	275/390	2/2		2				
FASiT200HA	35422RU	3	22	56	275/390	2/2		2				
FASiT500	35521RU	4	24	76	140/200	2/2		2				
FASiT700	17421RU	4	24	85	140/200	2/2		2				
FASiT900	174290U	4	24	85	140/200	2/2		2				
FASiT EXP500	35601RU	3	22	61	245/350	2/2		2				
FASiT EXP700	17401RU	3	23	91	245/350	2/2		2			2	
FC Switch 8-port	3534F08	1	17	17	-/50	1/1		1				
FC Switch 16-port	2109F16	1	25	28	-/200	1/2					1	
<b>Tape Units:</b>												
NetMEDIA	3551001	3	19	37	130/185	2/2	2					
NetBAY Tape Enclosure	0034BOX	4	18	39	300/430	1/1	1					
SDLT/LTO Modular Tape Library	4560SLX	5	31	70	300/430	1/1	1					
<b>Other Options:</b>												
1x4 Console Switch	09N4290	1	8	5	-/100	1/1		1		1		
2x8 Console Switch	09N4291	1	8	6	-/100	1/1		1		1		
Local Console Manager	1735L04	1	6	4	-/7	1/1				1		
Remote Console Manager	1735R16	1	11	8	-/40	1/1				1		
1U Flat Panel Console w/ Space Saver Keyboard	32P1031	1	24	28	-/100	1/1		1			1	
1U Flat Panel Console w/o keyboard	32P1032	1	24	26	-/100	1/1					1	
2U Flat Panel Console w/ Space Saver Keyboard	32P1702	2	27	33	-/100	1/1		1			1	
2U Flat Panel Console w/o keyboard	32P1703	2	27	31	-/100	1/1					1	



Power Supply Options						
Power Supply	Part Number	Usable with	Standard Power Cords			
			6ft NEMA 5-15P P/N 6952301	9ft NEMA 5-15P P/N 6952300	6ft NEMA 6-15P P/N 1838576	9ft IEC 320-C14 P/N 36L8886
126w	18P3576	2109-F16				1
350w	59P4057	x345				1
370w	31P6108	x360, RXE-100		1		1
370w	31P6133	x255 <sup>11</sup>				
560w	33P2753	x235 <sup>12</sup>	2			
1200w	48P7052	BladeCenter				2

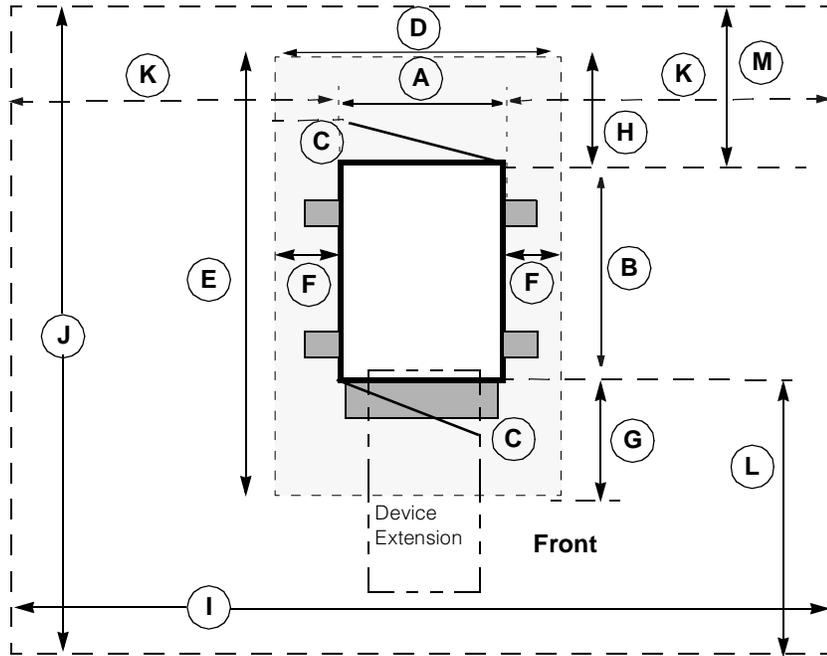
1. Requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) to mount server unit into an EIA rack cabinet.
2. Requires 4U Extended Depth Tower to Rack Conversion Kit (P/N 59P4817) to mount server unit into an EIA rack cabinet.
3. Requires 5Ux24D Tower-to-Rack Kit III (P/N 59P4211) to mount server unit into an EIA rack cabinet. Models are available with both a single 560w power supply and two hot-swap 560w power supplies.
4. Tower models require 7Ux26D Tower-to-Rack Kit (P/N 32P1474) to mount server unit into an EIA rack cabinet.
5. To provide adequate cooling, blank filler panel kit (P/N 94G6670) should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer a minimum of 48% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64mm (2 to 2.5in) must be maintained between the front of the door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Nonrack or NetBAY3 installations are not supported.
6. x370 requires installation of extension kit (P/N 36L9703 or 36L9702) when installed in a 9306-900, 910 or 9306-200, respectively, for proper rear door clearance.
7. Internal power supply logic limits low voltage (100-127VAC) to 550w per power supply. Thus, configurations requiring more power are not redundant for low voltage installations, e.g., configurations with more than two processors.
8. 1U = 1.75in (44.45mm).
9. The Rack Extension Kits (P/N 36L9703 or 36L9702) add eight inches to the rear of a 9306-900, 910 or 9306-200 for cable management and are recommended for systems greater than 24 inches in depth.
10. Optional rack power cords: P/N 94G6667 - 14ft NEMA 5-15P; P/N 94G7448 - 14ft IEC 320-C14.
11. Additional power cords are not required. This power supply option shares use of line cords provided with the base system. Should be ordered in pairs to maintain redundancy.
12. Option includes two 560w hot-swap power supplies and a power backplane.

General rack placement rules and other information:

- Locate heaviest components at the bottom of the rack (i.e., UPS, then servers or storage, etc.).
- Do not extend more than one component on side rails at a time.
- Maximum of three UPSs (including no more than two APC 5000 UPSs) per rack.
- Utilize sidewall compartments for mounting PDUs and console switches prior to using EIA space.
- When mounting components in a rack, consider user and service requirements.
- When selecting length of power, console and storage cables, consider extension of cable management arms and overall cable routing.
- BTUs = Watts x 3.41.



Rack Options		
Part Number	Description	Information
28L4707	Netfinity Rack Keyboard Tray	Supports keyboards in racks, also used with Flat Panel Monitor Rack Mount Kit II
28L3644	Space Saver II Keyboard	1U, includes TrackPoint IV, requires Rack Keyboard Tray (P/N 28L4707)
94G7444	Monitor Compartment	
633147N	E54 Color Monitor	9U, requires Monitor Compartment (P/N 94G7444)
63324HN	E74 Color Monitor	10U, requires Monitor Compartment (P/N 94G7444)
32P1702	NetBAY 2U Flat Panel Monitor Console Kit with Space Saver Keyboard (US)	2U, built-in 15in Flat Panel Monitor (15in viewable image), includes SpaceSaver Keyboard-US English (P/N 28L3644)
32P1703	NetBAY 2U Flat Panel Monitor Console Kit without keyboard	2U, built-in 15in Flat Panel Monitor (15in viewable image), space for SpaceSaver Keyboard
32P1031	NetBAY 1U Flat Panel Monitor Console Kit with Space Saver Keyboard (US)	1U, built-in 15in Flat Panel Monitor (15in viewable image), includes SpaceSaver Keyboard - US English (P/N 28L3644)
32P1032	NetBAY 1U Flat Panel Monitor Console Kit without keyboard	1U, built-in 15in Flat Panel Monitor (15in viewable image), space for SpaceSaver Keyboard
09N4290	NetBAY 1 x 4 Console Switch	1U, mounts in sidewall compartments, EIA space or Monitor Compartment; supports one to four servers, one console
09N4291	NetBAY 2 x 8 Console Switch	1U, mounts in sidewall compartments, EIA space or Monitor Compartment; supports one to eight servers, two consoles (only one console when installed in the Monitor Compartment)
09N4293	Console Cable Set - 7ft	Connects servers to console switch
94G7447	Console Cable Set - 12ft	Connects servers to console switch
1735L04	Local Console Manager	1U, mounts in sidewall compartments, EIA space or behind 1U Console Kit; supports one to 64 servers, one local console
1735R16	Remote Console Manager	1U, mounts in sidewall compartments or EIA space; supports one to 256 servers, one local console and two remote consoles
32P1636	Short KVM Conversion Option	Converts the console signals of servers without cable management arms (not on slides) so they can be chained to connect to a Local or Remote Console Manager using Cat5 cable
32P1652	Long KVM Conversion Option	Converts the console signals of servers with cable management arms (on slides) so they can be chained to connect to a Local or Remote Console Manager using Cat5 cable
32P1637	C2T Conversion Option	Converts the console signals of a chain of C2T-capable servers so they can be connected to a Local or Remote Console Manager using Cat5 cable
94G6666	100-120v Power Distribution Unit	1U, 100-120V, 12A, mounts in sidewall compartment or EIA space, eight NEMA 5-15R outlets, requires one L5-15R wall receptacle
37L6866	NetBAY Rack PDU (US)	1U, 100-240V, 15A, mounts in sidewall compartment or EIA space, seven IEC 320-C13 outlets, requires one NEMA L5-20R or L6-20R wall receptacle
37L6865	NetBAY Server Dual-cord PDU (US)	1U, 100-240V, 15/10A, mounts in sidewall compartment or EIA space, four IEC 320-C13 outlets, requires two NEMA L5-20R or L6-20R wall receptacles
37L6883	NetBAY 100-127v Single-phase Front-end PDU (US)	1U, 100-127V, 24A, mounts in sidewall compartment, three IEC 320-C19 outlets, requires one NEMA L5-30R wall receptacle
37L6884	NetBAY 200-240v Single-phase Front-end PDU (US)	1U, 200-240V, 24A, mounts in sidewall compartment, three IEC 320-C19 outlets, requires one NEMA L6-30R wall receptacle
73P5790	NetBAY 200-240v Single-phase 60a Front-end PDU (US)	1U, 200-240v, 48a, mounts in sidewall compartment, three IEC 320-C19 outlets, requires one IEC 309 2P+G wall receptacle
37L6886	NetBAY 3-phase Front-end PDU (US)	1U, input: 200-250V, 30A, three-phase service, mounts in sidewall compartment, output: three single-phase 115-145V, shared 41A, IEC 320-C19 outlets, requires one NEMA L21-30R wall receptacle
32P1020	APC 2U Smart-UPS 1400RMB	2U, 120V, 9.5A, six NEMA 5-15R outlets, requires one NEMA L5-15R wall receptacle
2130R30	UPS3000XLV (US)	2U, 120v, 24a, six IEC C13 outlets, 1 NEMA L5-20R outlet, requires one NEMA L5-30R wall receptacle
2130R31	UPS3000XHV (US)	2U, 200-240v, 14.25a, seven IEC C13 outlets, 1 IEC C19 outlet, requires one NEMA L6-30R wall receptacle
32P1692	UPS Extended Run Battery Pack	2U, up to four may be attached to the UPS3000XLV or XHV to extend run time when using the batteries
37L6861	APC Smart-UPS 5000RMB	5U, 208V, 18.75A, eight IEC 320-C13 outlets, two IEC 320-C19 outlets, requires one NEMA L6-30R wall receptacle; ships standard with two IEC 320-C19 to C20 cables to support PDUs
94G6670	Blank Filler Panel Kit	Consists of one 5U, one 3U, and two 1U blank filler panels
94G7442	Fixed Shelf	Supports up to 100lbs
94G6667	Rack Power Cord -Type A14	IEC 320-C13 to NEMA 5-15P (14ft)
94G7448	Rack Power Cord -Type C12	IEC 320-C13 to IEC 320-C14 (14ft)

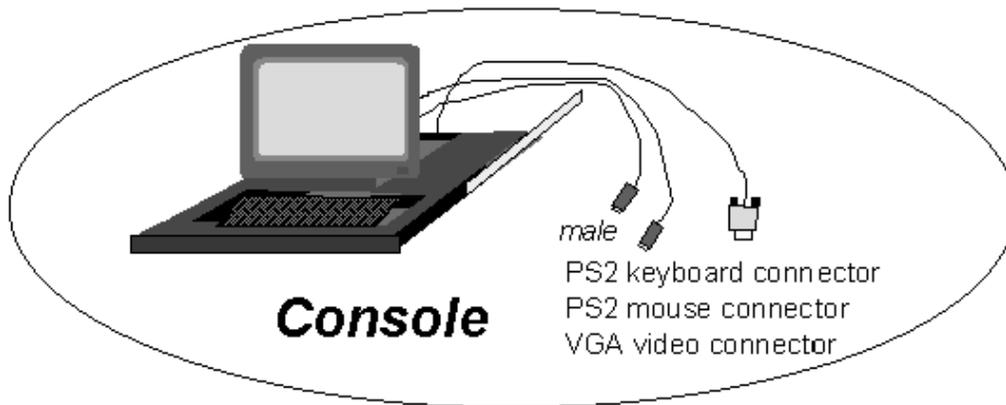


	9306-110 (inches)	9306-xxx (inches)	9308-xxx (inches)	Description
<b>Box Footprint</b>				
A	20.4	23.6	25.5	Width of rack
B	34.4	39.4	43.5	Depth of rack (not including front stabilizer)
C	21	24	26	Front and rear door clearance (when required)
<b>Operational Clearance</b>				
D	24.4	27.6	29.5	Width of Operational Clearance area
E	74.4	93.4	110	Depth of Operational Clearance area
F	2	2	2	Left/Right sides of rack to Operational Clearance area
G	30	36	36	Front of rack to Operational Clearance area
H	10	24	26	Rear of rack to Operational Clearance area
<b>Service Clearance</b>				
I	26	95.6	97.5	Width of Service Clearance area
J	78.3	129.4	133.5	Depth of Service Clearance area
K	2.8	36	36	Left/Right sides of rack to Service Clearance area
L	36	60	60	Front of rack to Service Clearance area
M	30	30	30	Rear of rack to Service Clearance area

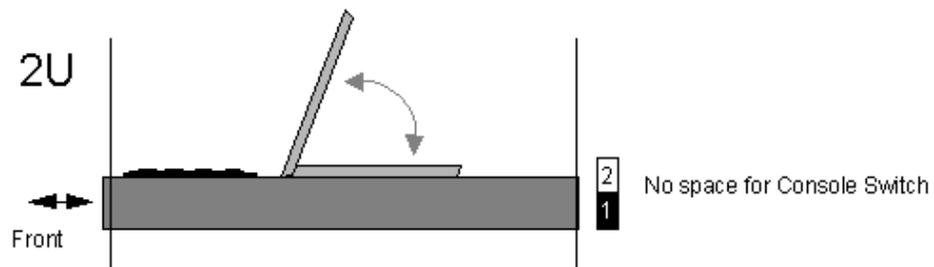
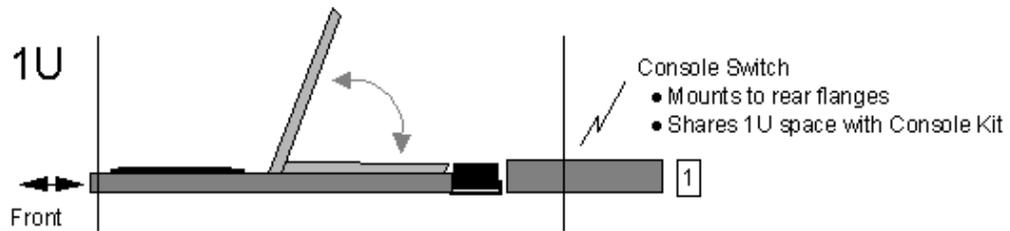
# Rack Console Options

A console consisting of a keyboard, monitor and pointing device is required by each server for system maintenance and support. The console may be local or remote and may be dedicated to a single server or shared across a large array of servers, which requires the use of one or more console switching devices.

## Flat Panel Monitor Console Kits



Rack Console Options

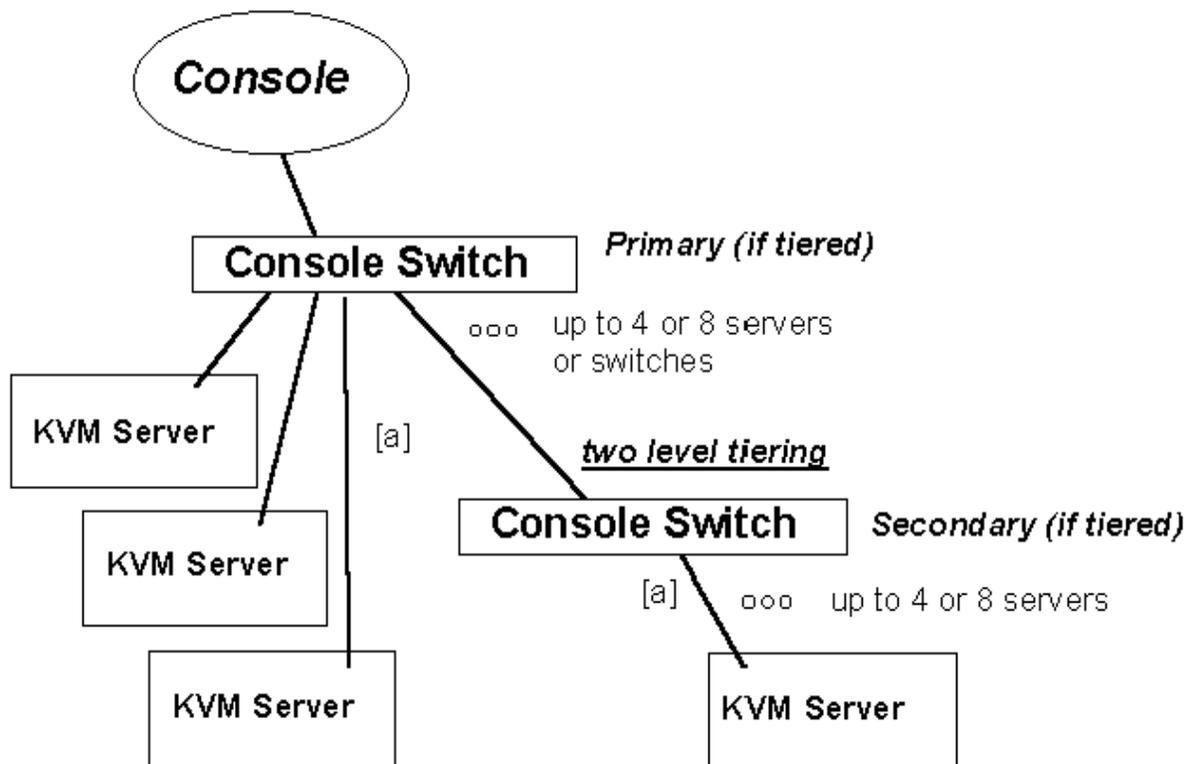




## Multi-server Console Switching

1. Standard PS/2 Keyboard - Video - Mouse (KVM)
2. IBM C2T Interconnect Cable Chaining Technology
3. IBM Advanced Connectivity Technology (ACT)

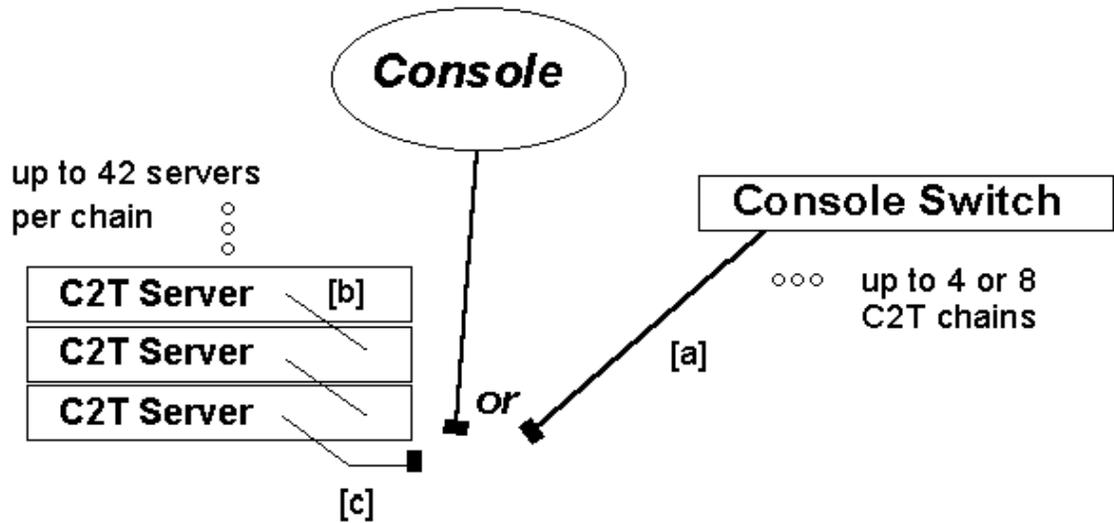
### 1. PS2 KVM Switching up to 64 servers



Refer to the cable labeling key in the Cable Options table appearing later in this section.

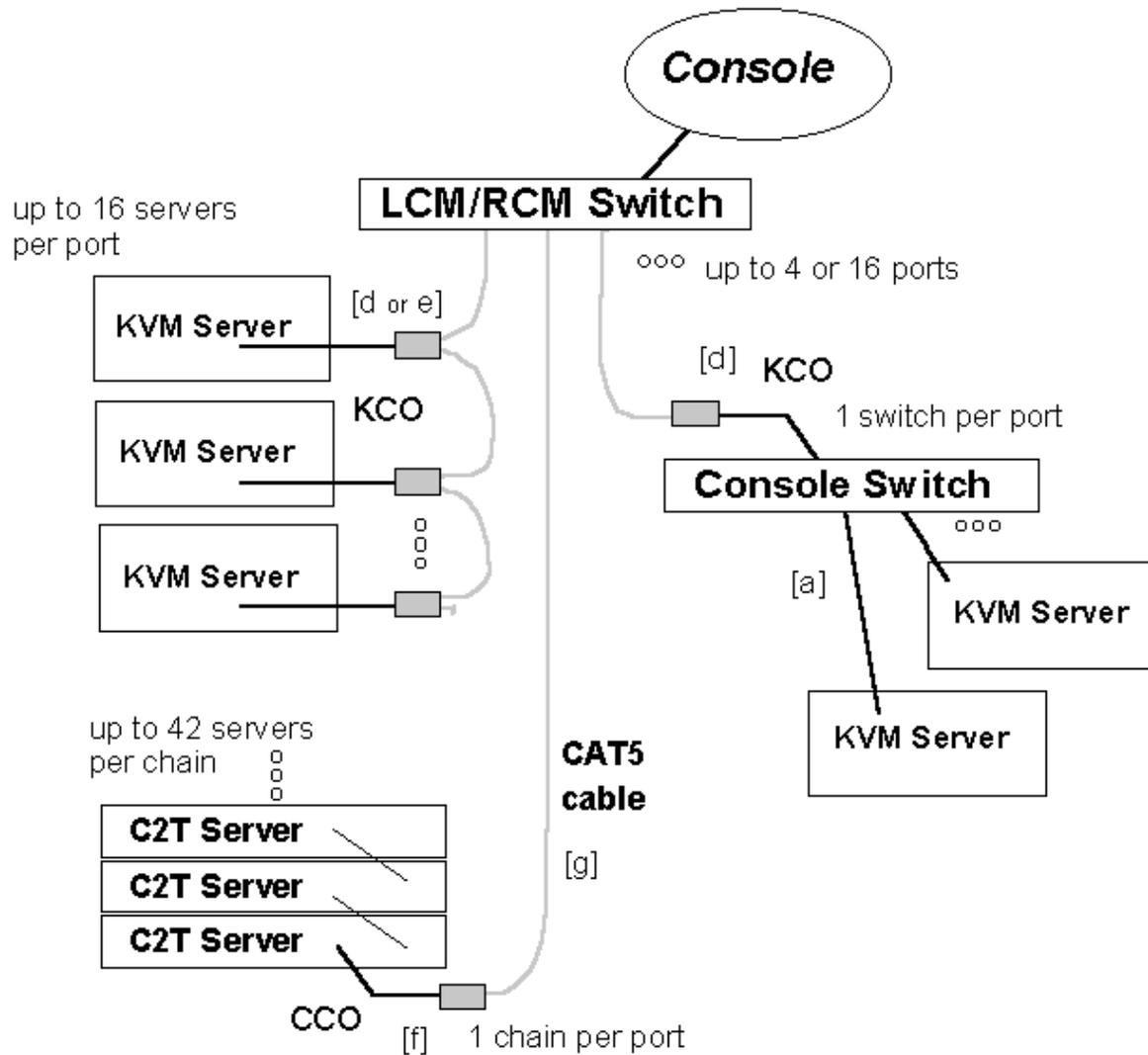
## 2. C2T Chaining

up to 336 servers



Refer to the cable labeling key in the Cable Options table appearing later in this section.

### 3. Advanced Connectivity Technology (ACT)



Switch Options																		
Part Number	Description	Type of switch	Ports				Capacity							Standard Parts				
			IN		OUT		max KVM servers	C2T chains	ACT chains	Two-level Tiering		local consoles	remote consoles	1 U blank filler panel	1.8m Cat5 cable	Cat5 terminator	EIA mounting brackets	side-wall mounting brackets
			Type	Qty	Type	Qty				KVM switches	max KVM servers							
09N4290	1x4 Console Switch	KVM	PS2	4	PS2	1	4	4	0	4	16	1	0	-	-	-	-	1
09N4291	2x8 Console Switch	KVM	PS2	8	PS2	2	8	8	0	8	64	2	0	1	-	-	1	1
1735L04	Local Console Manager	ACT	Cat5	4	PS2	1	64	64	4	4	32	1	0	1	1	4	1	1
1735R16	Remote Console Manager	ACT	Cat5	16	PS2 LAN	1 1	256	256	16	16	128	1	2	1	1	16	1	1

Switch Placement Rules				
Mounting Locations	1x4	2x8	LCM	RCM
monitor shelf \ switch bay	yes	yes	no	no
3U Console \ switch bay	yes	yes	yes	yes
1U Console \ switch bay	yes	yes	yes	no
with (above) 2U console	yes	yes	yes	yes
side-wall compartment	yes	yes	yes	yes
U compartment (EIA space)	no	yes	yes	yes

**Rack Console Options**



Cable Options														
Label	Part Number	Description	2.1m KVM cable (PS2 male to PS2 male)	3.8m KVM cable (PS2 male to PS2 male)	260mm C2T chaining cable <sup>4</sup> (C2T male to C2T male)	2m C2T chaining cable <sup>5</sup> (C2T male to C2T male)	2m C2T breakout cable (C2T male to PS2 female)	250mm KCO cable (PS2 male to RJ45)	1.5m KCO cable (PS2 male to RJ45)	150mm Cat5 cable (RJ45 to RJ45)	114mm CCO cable (C2T male to RJ45)	350mm Cat5 cable (RJ45 to RJ45)	1.8m Cat5 cable (RJ45 to RJ45)	Usage
[a]	09N4293	Console Cable Set - 7ft	1	-	-	-	-	-	-	-	-	-	-	servers with PS2 KVM ports <sup>1</sup>
[a]	94G7447	Console Cable Set - 12ft	-	1	-	-	-	-	-	-	-	-	-	servers with PS2 KVM ports <sup>1</sup>
[b]	with server	C2T chaining cable	-	-	1	-	-	-	-	-	-	-	-	(included with x330, x335) <sup>2</sup>
[c]	06P4792	C2T Cable Kit	-	-	-	1	1	-	-	-	-	-	-	x330, x335
[d]	32P1636	short KVM Conversion Option kit	-	-	-	-	-	4	-	4	-	-	-	(x300, x305, Console Switch) <sup>3</sup>
[e]	32P1652	long KVM Conversion Option kit	-	-	-	-	-	-	4	-	-	-	4	servers with cable management arms
[f]	32P1637	C2T Conversion Option kit	-	-	-	-	-	-	-	-	1	-	1	x330, x335
[g]	-	Cat5 cable	provided with option or by customer											

1. PS2 KVM connectors: keyboard 5-pin DIN, mouse 5-pin DIN, video HD-15 VGA.

2. C2T interconnect ports use special connectors.

3. ACT conversion options convert from PS2 KVM or C2T interconnect to Cat5 RJ45 connectors.

4. Short C2T chaining cable included standard with the C2T-capable servers.

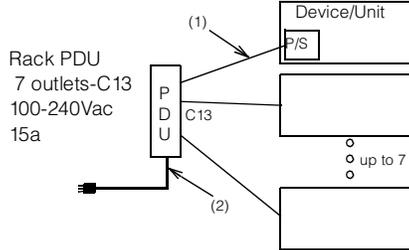
5. C2T Cable Kit (P/N 06P4792) includes a long C2T chaining cable for use when interconnect servers are farther than three EIA units apart.

NOTE: KVM switches may be interconnected to form a two-level tier for attaching up to 16, 32 or 64 servers.

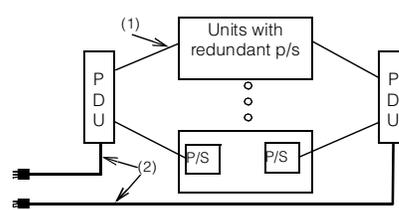
# NetBAY Rack Power Configurator

## Possible Power Configurations:

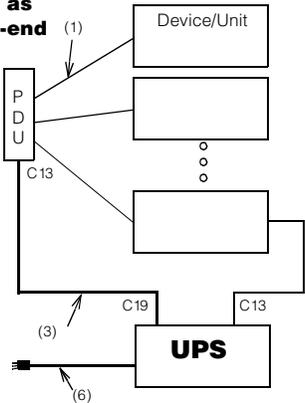
### Single Rack PDU



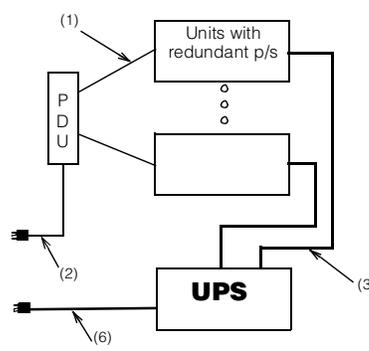
### Redundant Power Distribution



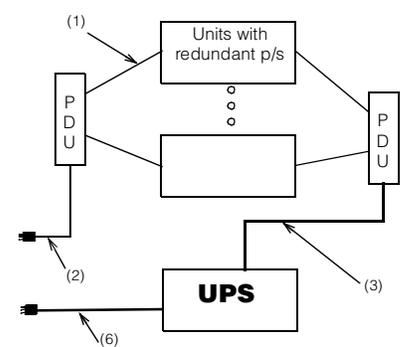
### PDU used as UPS back-end



### Redundant Power Distribution with PDU and UPS



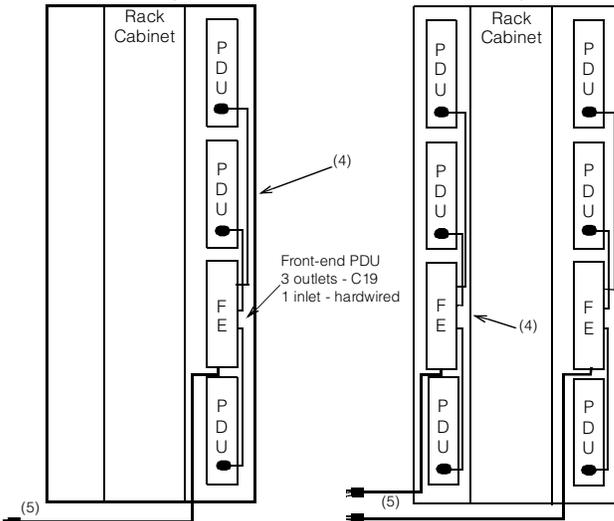
### Redundant Power Distribution with PDU and UPS with PDU



## Typical Rack Power Configurations:

**Simple** -- three Rack PDUs and one Front-end PDU (single circuit, 21 outlets)

**Redundant** -- six Rack PDUs and two Front-end PDUs (dual circuit, 42 outlets)



### Rack Rules:

Total PDUs (LV PDUs, HV PDUs, Rack PDUs, Server PDUs, FE PDUs) = 8  
Total Server PDUs = 3  
Total Front-end PDUs = 2

### Outlets:

Outlets	C19	C13
Rack PDU	0	7
Server PDU	0	4
Front-end PDU	3	0

### NOTES:

- Each device/unit usually comes with a power cord. The PDU requires the power cord to have an IEC 320-C14 plug. Order P/N 94G7448 (14ft) if appropriate cord is not provided by the device/unit.
- Each PDU and UPS comes with a country-specific power cord.
- Internal rack power cable provided with APC SmartUPS 5000 UPS.
- Internal rack power cable provided with Front-end PDU.
- Line cord provided with Front-end PDU.
- UPS comes with a country-specific power cord or a terminal block.
- Customer responsible to provide a dedicated circuit for each line cord protected with an appropriate circuit breaker.
- P/S = Power Supply.

Outlets	US models			EMEA models	
	C19	C13	NEMA	C19	C13
APC 1400RMB	0	0	6	0	4
APC 3000RMB	0	0	8	1	8
APC 5000RMB	2	8	0	2	8



# Country-Specific Considerations: USA, Canada, parts of Latin America, Taiwan

## Power Cables:

- 1. Device to Rack PDU power cable**  
IEC C13 to C14, 10/15a cable  
typical: P/N 36L8886 (2.8m)  
requirement: C14 plug, long enough to reach available option: 94G7448 (14ft)
- 2. Rack PDU to wall line cord**  
IEC C19 to country-specific connector, 16/20a, 14ft (4.3m)
- 3. Rack PDU to UPS power cable**  
IEC C19 to C20, 16/20a  
P/N 00N7700 (2m)  
provided with P/N 37L6861 (APC SU-5000RMB)
- 4. Rack PDU to Front-end PDU power cable**  
IEC C19 to C20, 16/20a  
P/N 00N7698 (1m)  
provided with the Front-end PDUs
- 5. FE PDU to wall line cord**  
special to country-specific connector, 30a, 8.2ft (2.5m)

(2) Line Cords: Rack PDU

Part Number	Plug Type	Source Circuit (single phase 50/60Hz)	PDU Output (single phase 50/60Hz)
37L6866	NEMA L5-20P	100-127Vac, 20a	seven 100-127Vac, shared 15a
	NEMA L6-20P	200-240Vac, 20a	seven 200-240Vac, shared 15a

(5) Line Cords: Type W PDU

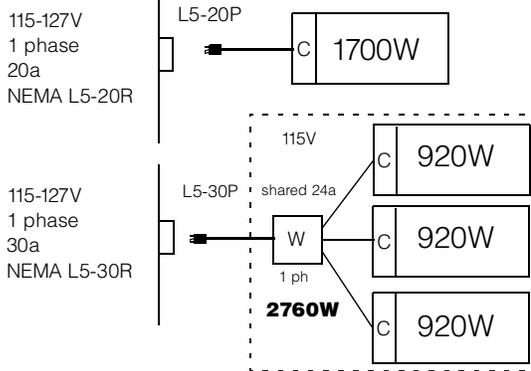
Part Number	Plug Type	Source Circuit (50/60Hz)	PDU Output (single phase 50/60Hz)
37L6883	NEMA L5-30P	100-127Vac, 30a, single-phase	three 100-127Vac, 20a each, shared 24a
37L6884	NEMA L6-30P	200-240Vac, 30a, single phase line-to-line with ground	three 200-240Vac, shared 24a
37L6886	NEMA L21-30P	200-250Vac, 30a, three-phase Y-connection with neutral	three 100-127Vac (115-145), 20a each, shared 41a

## Power Load Capacity -- xSeries / Netfinity Rack Systems

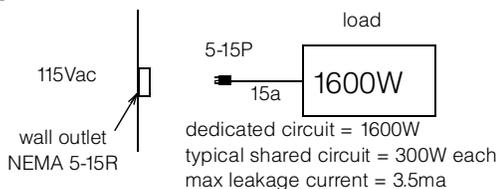
NOTE:

C = Rack PDU with a 15a circuit breaker  
W = FE PDU with a 20a fuse per outlet dedicated circuit  
max leakage current > 3.5ma

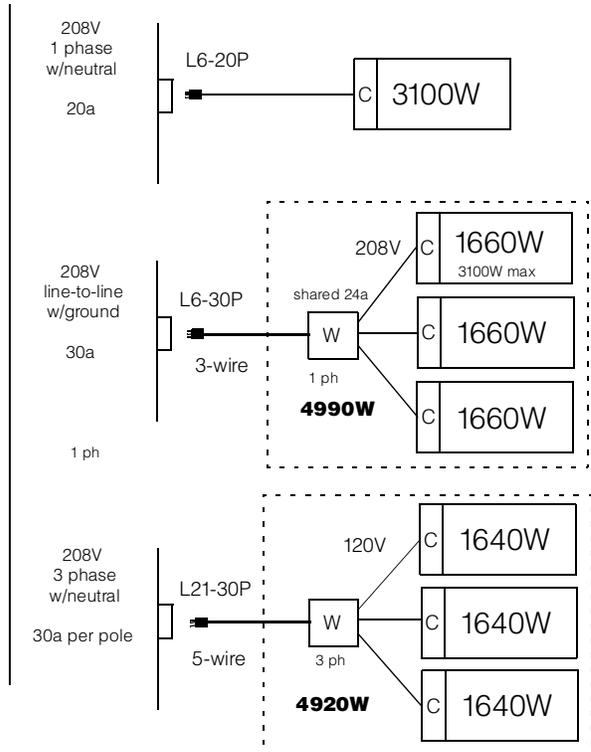
### Low Voltage



### Typical Office



### High Voltage



NOTE: Actual power values (watts) may vary based on actual source voltage.



# Country-Specific Considerations: Europe, Mid-East, Africa, Asia Pacific, parts of Latin America

## Power Cables:

- 1. Device to Rack PDU power cable**  
IEC C13 to C14, 10/15a cable  
typical: P/N 36L8886 (2.8m)  
requirement: C14 plug, long enough to reach available option: 94G7448 (14ft)
- 2. Rack PDU to wall line cord**  
IEC C19 to country-specific connector, 16/20a, 14ft (4.3m)
- 3. Rack PDU to UPS power cable**  
IEC C19 to C20, 16/20a  
P/N 00N7700 (2m)  
provided with P/N 37L6861 (APC SU-5000RMB)
- 4. Rack PDU to Front-end PDU power cable**  
IEC C19 to C20, 16/20a  
P/N 00N7698 (1m)  
provided with the Front-end PDUs
- 5. Front-end PDU to wall line cord**  
special to country-specific connector, 30/32a, 8.2ft (2.5m)

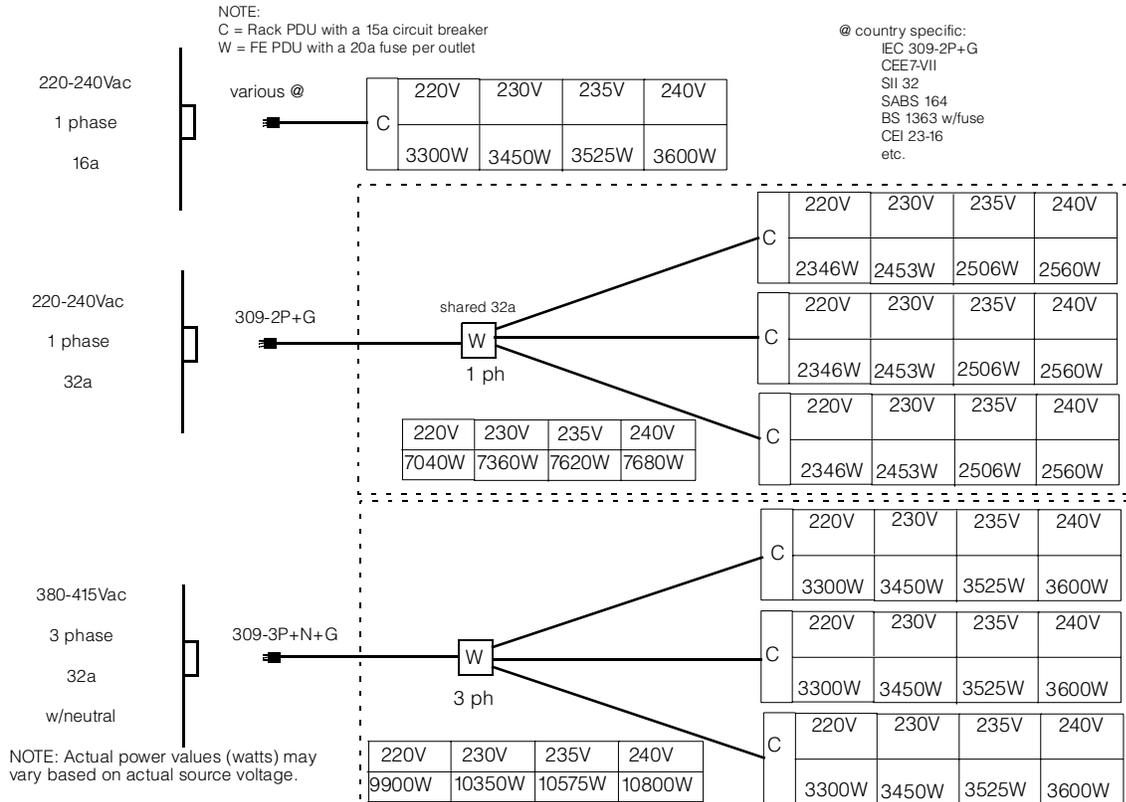
(2) Line Cords: Rack PDUs

Part Number	Plug Type	Source Circuit (single phase 50/60Hz)	PDU Output (single phase 50/60Hz)
37L6866	NEMA L5-20P	100-127Vac, 20a	seven 100-127Vac, shared 15a
	NEMA L6-20P	200-240Vac, 20a	
37L6868	CEE7-VII	220-240Vac, 16a	seven 220-240Vac, shared 15a
37L6870	IEC 309-2P+Gnd	220-240Vac, 16a	
37L6872	SII 32	220-240Vac, 16a	
37L6874	CEI 23-16	220-240Vac, 16a	
37L6876	SABS 164	220-240Vac, 16a	
06P6028	BS 1363/A	220-240Vac, 13a	
37L6864	country-specific line cord provided by IBM	country specific	seven 220-240Vac, shared 13a

(5) Line Cords: Front-end PDUs

Part Number	Plug Type	Source Circuit (50/60Hz)	PDU Output (single phase 50/60Hz)
37L6883	NEMA L5-30P	100-127Vac, 30a, single-phase	three 100-127Vac, 20a each, shared 30a
37L6884	NEMA L6-30P	200-240Vac, 30a, single phase line-to-line with ground	three 200-240Vac, shared 24a
37L6886	NEMA L21-30P	200-250Vac, 30a, three-phase Y-connection with neutral	three 100-127Vac (115-145), 20a each, shared 41a
37L6885	IEC 309-2P+Gnd	220-240Vac, 32a, single-phase	three 220-240Vac, 16a each, shared 32a
37L6887	IEC 309-3P+N+Gnd	380-415Vac, 32a, three-phase Y-connection with neutral	three 220-240Vac, 16a each

## Power Load Capacity -- xSeries / Netfinity Rack Systems





## Country-Specific Considerations: Japan

### Power Cables:

- 1. Device to Rack PDU power cable**  
IEC C13 to C14, 10/15a cable typical: P/N 36L8886 (2.8m) requirement: C14 plug, long enough to reach available option: 94G7448 (14ft)
- 2. Rack PDU to wall line cord**  
IEC C19 to country-specific connector, 16/20a, 14ft (4.3m)
- 3. Rack PDU to UPS power cable**  
IEC C19 to C20, 16/20a P/N 00N7700 (2m) provided with P/N 37L6861 (APC SU-5000RMB)
- 4. Rack PDU to Front-end PDU power cable**  
IEC C19 to C20, 16/20a P/N 00N7698 (1m) provided with the Front-end PDUs
- 5. Front-end PDU to wall line cord**  
special to country-specific connector, 30/32a, 8.2ft (2.5m)

(2) Line Cords: Rack PDUs

Part Number	Plug Type	Source Circuit (single phase 50/60Hz)	PDU Output (single phase 50/60Hz)
37L6866	NEMA L5-20P	100Vac, 20a	seven 100Vac, shared 15a
	NEMA L6-20P	200Vac, 20a	seven 200Vac, shared 15a

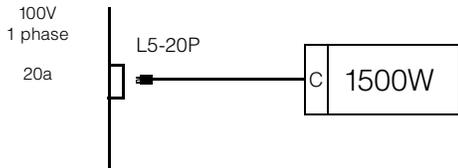
(5) Line Cords: Front-end PDUs

Part Number	Plug Type	Source Circuit (50/60Hz)	PDU Output (single phase 50/60Hz)
37L6883	NEMA L5-30P	100-127Vac, 30a, single-phase	three 100-127Vac, 20a each, shared 30a
37L6884	NEMA L6-30P	200-240Vac, 30a, single phase line-to-line with ground	three 200-240Vac, shared 30a
37L6886	NEMA L21-30P	200-250Vac, 30a, three-phase Y-connection with neutral	three 100-127Vac (115-145), 20a each, shared 41a
37L6885	IEC 309-2P+Gnd	220-240Vac, 32a, single-phase	three 220-240Vac, 16a each, shared 32a
37L6887	IEC 309-3P+N+Gnd	380-415Vac, 32a, three-phase Y-connection with neutral	three 220-240Vac, 16a each

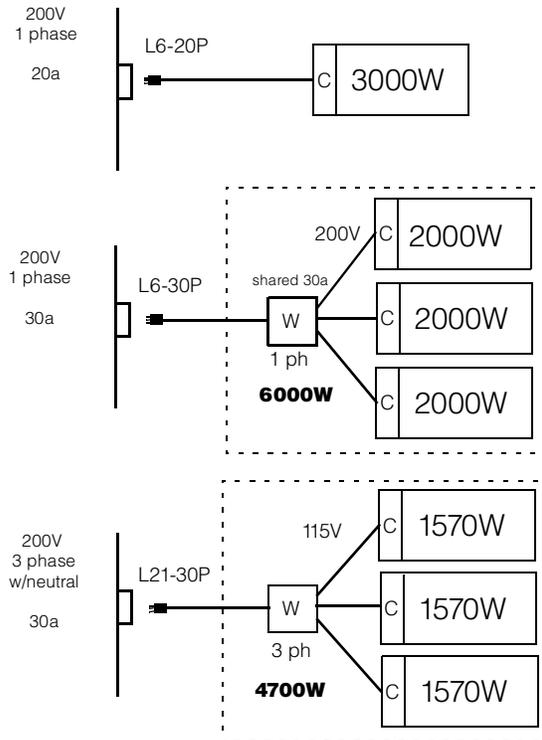
## Power Load Capacity -- xSeries / Netfinity Rack Systems

NOTE:  
C = Rack PDU has a 15a circuit breaker  
W = FE PDU has a 20a fuse

### Low Voltage



### High Voltage



NOTE: Actual power values (watts) may vary based on actual source voltage.



# Appendix A: Tape Drive Attributes

Part Number	Description	SCSI Interface (bit)	Form Factor	Max. storage (GB)-Native/ Compressed <sup>2</sup>	MB/sec - Native/comp <sup>2</sup>	Termination Incl	Internal Cables	Data/Cleaning Cartridges Included	Ext Tape Enclosures <sup>1</sup>
<b>Tape Drives</b>									
48P7042	20/40GB TR7 Internal IDE Tape Drive	-	89mm (3.5in) SL or 133mm (5.25in) HH	20/40	2/4	-	-	1/1	-
00N7991	20/40GB DDS/4 4mm Internal Tape Drive	16 Ultra2 LVD	89mm (3.5in) HH or 133mm (5.25in) HH	20/40	2.75/5.5	Y <sup>10</sup>	34in LVD	1/1	3510020 <sup>4</sup> , 3551001 <sup>3</sup> , 0034BOX
00N7990	40/80GB DLT Internal SCSI Tape Drive	16 Ultra2 LVD	133mm (5.25in) FH	40/80	6/10	Y <sup>10</sup>	34in LVD	1/1	3503B1X, 3551001 <sup>3</sup> , 0034BOX
00N8016	100/200GB LTO Tape Drive	16 Ultra2 LVD	133mm (5.25in) FH	100/200	15/30	Y <sup>10</sup>	34in LVD	1/1	3551001 <sup>3</sup> , 3503B1X 0034BOX
24P2396	100/200GB LTO Half-High Tape Drive <sup>15, 16</sup>	16 Ultra2 LVD	133mm (5.25in) HH	100/200	8/16	Y <sup>10</sup>	34in LVD	1/1	3551001 <sup>3</sup> , 3510020 <sup>4</sup> , 0034BOX
00N8015	110/220GB Super DLT Internal SCSI Tape Drive	16 Ultra2 LVD	133mm (5.25in) FH	110/220	11/22	Y <sup>10</sup>	34in LVD	1/1	3551001 <sup>3</sup> , 3503B1X 0034BOX
24P2398	40/80GB Half-High DLTVS Internal SCSI Tape Drive <sup>16</sup>	16 Ultra2 LVD	133mm (5.25in) HH	40/80	3/6	Y <sup>10</sup>	34in LVD	1/1	3551001 <sup>3</sup> , 3510020 <sup>4</sup> , 0034BOX
59P6736	160/320GB SDLT Tape Drive	16 Ultra2 LVD	133mm (5.25in) FH	160/320	16/32	Y <sup>11</sup>	34in LVD	1/1	0034BOX 3503B1X
<b>Associated Options</b>									
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	16 LVD/SE	Ext	-	-	Y	-	-	3510020
<b>Tape Autoloaders</b>									
00N7992	120/240GB DDS/4 Tape Autoloader	16 Ultra2 LVD	133mm (5.25in) FH	120/240	3/6	Y <sup>10</sup>	-	5/1	3551001, 3503B1X 0034BOX
360716X	3607 Series 1760GB/1.8TB SDLTpro Tape Autoloader	16 Ultra2 LVD	2U Rack	1760/3.53TB	11/22	Y	-	1/1	-
<b>External Tape Enclosures</b>									
0034BOX	NetBAY Tape Enclosure (Rack Mount) <sup>5</sup>	16 Ultra2 LVD	4U Rack	-	-	N	-	1/1	-
3510020	External Half High SCSI Storage Enclosure <sup>6</sup>	16 Ultra2 LVD	Desktop	-	-	N	16-bit	-	-
3551001	NetMEDIA Storage Expansion Unit EL <sup>7</sup>	16	Rack	-	-	Y	2 x 16-bit, 4-drop	-	-
3503B1X	Full-High SCSI Tape Enclosure <sup>8</sup>	16 Ultra2 LVD	Desktop or 3U Rack	-	-	Y	16-bit	-	-
<b>External Tape Libraries<sup>9</sup></b>									
3570C2x	Magstar MP 3570 Tape Subsystem	HVD	6U Rack	100/300	2.2/6 or 7/15	Y	-	1/1	-
4560SLX	SDLT/LTO Modular Tape Library	16 Ultra2 LVD	5U Rack	4.16TB/8.32TB (all SDLT); 3TB/6TB (all LTO) <sup>12</sup>	16/32 (all SDLT); 15/30 (all LTO) <sup>13</sup>	Y	-	0/0 <sup>14</sup>	-

1. To determine cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure then refer to Appendix D: Cables - Storage Units - Controllers. For installation of an internal tape drive into a server, see the appropriate system section.  
 2. Data compression typically provides a 2X improvement in capacity and transfer rate, but since data compression is affected by many factors, actual improvements may be more or less than 2X.  
 3. LVD support for LVD tape drives installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) is provided by two four-drop internal LVD cables.  
 4. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).  
 5. NetBAY Tape Enclosure (P/N 0034BOX) is a 4U rack-mounted enclosure that supports four full-high or six half-high tape drives. The backplate includes six 0.8mm VHDCI external connectors for attachment of up to six servers. Internal connection of tape drives requires the single-drop terminated LVD SCSI cable that ships with the tape drive, which also provides termination for the SCSI bus. A single 300w power supply with a low voltage power cord is standard. An external SCSI storage cable is not provided. Refer to Appendix D: Cables - Storage - Controllers to select a supported cable.  
 6. Black desktop tape enclosure that supports a single 133mm (5.25in) half-high (HH) tape drive. Internal and external connectors are 68-pin high-density supporting LVD. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956). External cables are not included. Refer to Appendix D: Cables - Storage Units - Controllers to select a supported cable.  
 7. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, rack-mountable tape enclosure which includes two full-high (FH) or four half-high (HH) extended length 133mm (5.25in) bays, two external 0.8mm VHDCI connectors and two internal four-drop LVD terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. External storage cables are not included. Refer to Appendix D: Cables - Storage - Controllers to select a supported cable.  
 8. Black desktop or 3U rack tape enclosure supports a single 133mm (5.25in) full-high LVD tape device including DLT tape drives. Requires a fixed shelf if installed in a rack (allow additional 1U for fixed shelf). Includes a 90w power supply, cooling fan, external terminator, power cord (country-specific), and 2m 68-pin to 0.8mm external cable. Supports the following full-high tape options: 00N8015, 00N8016, 00N7992, 00N7990.  
 9. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.

Tape Attributes



10. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option. When installed in a NetMEDIA Storage Expansion Unit, termination is also provided by the standard cables shipped with the enclosure.
11. Termination requires installing the 34in single-drop, terminated LVD SCSI cable provided with the option.
12. 4560 Automation Tape Enclosure Library supports either LTO or SDLT (or both if the application software supports mixed media and the drives and magazines are matched). Up to eight units can be stacked. Two magazines and two drive sleds can be installed in each unit. An external LVD SCSI cable with 0.8mm VHDCI connectors at each end ships standard with the library unit. A single 300w power supply with an IEC 320-C13 to NEMA 5-15P low voltage power cord is standard.
13. Data transfer speed is rated separately for LTO and SDLT media. Compressed speed may be less than the maximum rate provided.
14. LTO and SDLT data cartridges are not provided standard. Cleaning cartridges are shipped standard with LTO and SDLT drive sleds.
15. This tape drive must be shipped separately as an option and installed at a customer site. Factory or vendor installation prior to shipping is not supported.
16. Supported only in new builds of External Half-High SCSI Storage Enclosure (P/N 3510020), indicated by AI Header J1PJK on the outside box label of the tape enclosure.



# Appendix B: Tape Library Attributes

## SCSI Interface and Cable Legend

M: Male - External  
 68: 16-bit, 68-pin High Density connector  
 0.8: 16-bit, 68-pin Very High Density Connection Interface (VHDCI) 0.8mm connector  
 SE: Single-ended SCSI  
 HVD: High Voltage Differential SCSI  
 LVD: Low Voltage Differential SCSI

Part Number	Description	SCSI Interface	Form Factor	Terminator Included	Ext Cables Incl (length)	SCSI Controllers Incl	Data Cartridges std/max	Cleaning Cartridges std	Cartridge Mags std/max	Qty of drives - std/max	Max storage-Native/Compressed	MB/sec - Native/compr. <sup>7</sup>
<b>4560 Automation Tape Enclosure Library</b>												
4560SLX	SDLT / LTO Modular Tape Library (5U rack) <sup>2</sup>	LVD	5U Rack	Y	M0.8-M0.8 (4m)	N	0/30 (LTO only); 0/26 (SDLT only)	-	0/2	0/2	4.16TB/8.32TB (all SDLT); 3TB/6TB (all LTO) <sup>9</sup>	16/32 (all SDLT); 15/30 (all LTO) <sup>9</sup>
59P6657	Modular Fibre Channel Option <sup>3</sup>	LVD	-	-	M0.8-M0.8 (0.5m)	-	-	-	-	-	-	-
59P6658	Modular LTO Drive Upgrade Option <sup>4</sup>	LVD	-	-	Jumper (0.5m)	N	-	1	-	-	-	15/30 <sup>9</sup>
59P6659	Modular LTO Cartridge Magazine Option <sup>5</sup>	LVD	-	-	-	-	0/15	-	-	-	3TB/6TB <sup>9</sup>	-
59P6660	Modular SDLT Drive Upgrade Option <sup>4</sup>	LVD	-	-	Jumper (0.5m)	N	-	1	-	-	-	16/32 <sup>9</sup>
59P6661	Modular SDLT Cartridge Magazine Option <sup>6</sup>	LVD	-	-	-	-	0/13	-	-	-	4.16TB/8.32TB <sup>9</sup>	-
59P6662	Modular Elevator Link Option <sup>7</sup>	LVD	-	-	-	-	-	-	-	-	-	-
59P6663	Modular Elevator Link Extension Option <sup>8</sup>	LVD	-	-	-	-	-	-	-	-	-	-
08L9120	LTO Data Cartridge	LVD	-	-	-	-	-	-	-	-	100GB/200GB	-
35L1119	SDLT Data Cartridge	LVD	-	-	-	-	-	-	-	-	160GB/320GB	-
<b>Magstar Tape Systems</b>												
3570C21	Magstar MP 3570 Tape Subsystem <sup>10</sup>	HVD	6U Rack	Y	(4.5m)	Y	1/20	1	2/2	1/2	100GB/300GB	7/15
3570C22	Magstar MP 3570 Tape Subsystem <sup>10</sup>	HVD	6U Rack	Y	(4.5m)	Y	1/20	1	2/2	2/2 <sup>15</sup>	100GB/300GB	7/15
08L6517	3570 Adapter Card Kit <sup>11</sup>	HVD	-	Y	(4.5m)	Y	-	-	-	-	-	-
08L6480	Second "C" Drive for C21 <sup>12</sup>	HVD	-	-	-	N	-	-	-	-	-	7/15
<b>Magstar MP Media<sup>13</sup></b>												
05H2462	Magstar MP Fast Access Linear Tape Cartridge, B-format <sup>14</sup>	-	-	-	-	-	-	-	-	-	-	-
05H2463	Magstar MP Cleaning Cartridge	-	-	-	-	-	-	-	-	-	-	-
08L6187	Magstar MP Fast Access Linear Tape Cartridge, C-format	-	-	-	-	-	-	-	-	-	-	-

- Transfer rates are for single SCSI channel configurations. Tape libraries utilizing split library or dual host configurations may obtain higher rates. Data compression typically provides a 2X improvement in capacity and transfer rate, but since data compression is affected by many factors, actual improvements may be more or less than 2X.
- SDLT/LTO Tape Library supports either LTO or SDLT (or both if the application software supports mixed media and the drives and magazines are matched). Up to eight units can be stacked. Two magazines and two drive sleds can be installed in each unit. An external LVD SCSI cable with 0.8mm VHDCI connectors at each end ships standard with the library unit. A single 300W power supply with an IEC 320-C13 to NEMA 5-15P low voltage power cord is standard. Attaches to a single host server using a SCSI connection or to either a Fibre Channel switch or single server through a Fibre Channel connection if a Modular Fibre Channel Option is installed.
- Ships with external LVD SCSI cable with 0.8mm VHDCI connector for connection to the tape drive. Requires a short- or long-wave SFP Module (P/N 19K1271, 2) for connection to Fibre Channel cable. Supports three to four drive sleds (or two layers) only. Fibre Channel attachment includes either a single server using a FC2-133 Host Bus Adapter or a Fibre Channel switch.
- Ships with external LVD SCSI cable. Supported configurations are none, one or two drives. When a drive sled is not installed, the library unit must be cabled to another unit that contains at least one drive upgrade option. The Modular LTO Drive Upgrade Option includes one LTO Cleaning Cartridge (P/N 08L9124) and the Modular SDLT Drive Upgrade Option includes one SDLT Cleaning Cartridge (P/N 19P4357).
- One or two magazines are supported. Up to 15 tape data cartridges (P/N 08L9120) are supported in each magazine.
- One or two magazines are supported. Up to 13 tape data cartridges (P/N 35L1119) are supported in each magazine.
- Required to connect two library units.
- Required to connect each additional library unit (from three through eight).
- Data transfer speed and capacity are rated separately for LTO and SDLT media. Compressed speed and data capacity may be less than the maximum indicated.
- Includes rack mounting hardware and two power cords (120V and 250V). Models B22 and C22 include an additional two power cords.
- Required for Dual Host or Split Library configurations with 3570B2x or 3570C2x containing two drives.
- Required for either dual host or split library operation. Should be installed by qualified service personnel.
- Magstar MP Media can be ordered by calling 888-IBM-MEDIA or 888-426-6334 in the US, Canada, or Puerto Rico.
- B-format tape cartridges can be used in either Magstar MP 3570 Model B or C tape drives.
- The two tape drives are daisy-chained on the same SCSI bus with an included 0.5m SCSI cable. Dual Host and Split Library configurations require 3570 Adapter Card Kit (P/N 08L6517).

Tape Attributes



# Appendix C: UPS Runtime Estimate (minutes)

<b>Servers</b>	<b># Pwr Cords Std/Max</b>	<b>Watts Load Typ/Max<sup>1</sup></b>
xSeries 205 <sup>2</sup>	1/1	340/485
xSeries 225 (single power supply) <sup>2</sup>	1/1	420/600
xSeries 225 (redundant power supplies) <sup>2</sup>	2/2	350/500
xSeries 235 <sup>2</sup>	1/2	560/800
xSeries 255 (two power supplies) <sup>2</sup>	2/2	370/530
xSeries 255 (four power supplies) <sup>2</sup>	2/2	530/1000
xseries 305 <sup>2</sup>	1/1	140/200
xSeries 335 <sup>2</sup>	1/1	245/340
xSeries 345 <sup>2</sup>	1/2	350/500
xSeries 360 <sup>2</sup>	2/3	520/740
xSeries 440 <sup>2</sup>	2/2	800/950
<b>Other Devices</b>		
RXE-100 (8684-1RX) <sup>2</sup>	2/2	260/370
EXP300 Storage Expansion Unit (35311RU) <sup>2</sup>	2/2	285/360
FASiT200 Storage Server (35421RU) <sup>2</sup>	2/2	275/390
FASiT200 HA Storage Server (35422RU) <sup>2</sup>	2/2	275/390
FASiT500 Storage Server (35521RU) <sup>2</sup>	2/2	140/200
FASiT700 Storage Server (17421RU) <sup>2</sup>	2/2	275/390
FASiT900 Storage Server (174290U) <sup>2</sup>	2/2	275/390
FASiT EXP500 Storage Expansion Unit (35601RU) <sup>2</sup>	2/2	245/350
FASiT EXP700 Storage Expansion Unit (17401RU) <sup>2</sup>	2/2	245/350
TotalStorage SAN Switch F08, 8-port (3534F08)	1/1	50/n/a
SAN Fibre Channel Switch, 16-port (2109F16)	1/2	200/n/a
SAN Data Gateway Router UltraScsi LVD Port (2108R3L)	1/1	90/n/a
Magstar MP 3570 Tape Subsystem (C2x)	1/1	140/200
NetMEDIA Storage Expansion Unit EL (3551)	2/2	130/185
NetBAY Tape Enclosure (0034B0X)	1/1	300/430
SDLT/LTO Modular Tape Library (4560SLX)	1/1	300/430

1. This table represents general guidelines for selecting the appropriate UPS based on minimum and typical runtime estimates. A 'maximum configuration' load will result in 'minimum' UPS runtime. 'Typical' loads are based on a production system running at approximately 70% of maximum capacity. The 'typical' loads represent a more likely configuration and is a more likely estimate of runtime. Customer environments are unique and are unlikely to be precisely represented by any of the specific entries in the table.

2. Power-Factor Corrected (PFC) power supply.



	Tower				Rack Mounted			
	INT'L P/N	SU-700iNET 94G4073	SU-1000iNET 94G4074	SU-1400iNET 94G4075	SU-2200iNET 94G4076	2U SU-1400RMiB 32P1022 <sup>5</sup>	SU-3000RMiB 94G6677	SU-5000RMiB 37L6862
	US P/N	SU-700NET 94G3134	SU-1000NET 94G3135	SU-1400NET 94G3136	Not Available	2U SU-1400RMB 32P1020	SU-3000RMB 94G6676	SU-5000RMB 37L6861
<b>UPS Attributes</b>								
Communications Links to Servers		1	1	1	1	1	3	3
Color		black	black	black	white	black	black	black
EIA Height		-	-	-	-	2U	3U	5U
<b>Int'l Models</b>								
50 or 60Hz, single phase, VAC: <sup>2,3</sup>		220-240(xxx)	220-240(xxx)	220-240(xxx)	220-240(xxx)	220-240(xxx)	220-240(xxx)	220-240(xxx)
10-Amp, IEC 320-C13 (Device) receptacles		4	4	4	8	4	8	8
16-Amp, IEC 320-C19 (PDU) receptacles		-	-	-	1	-	1	2
Line Cord Receptacle (IEC 320-)		C14	C14	C20	C20	C14	C20	TB <sup>5</sup>
<b>US Models</b>								
50 or 60Hz, single phase, VAC: <sup>2</sup>		120 (120)	120 (120)	120 (120)	-	120 (120)	120 (120)	200-220 (208)
Receptacles (NEMA 5-15R)		4	6	6	-	6	8	-
10-Amp, IEC 320-C13 (Device) receptacles		-	-	-	-	-	-	8
16-Amp, IEC 320-C19 (PDU) receptacles		-	-	-	-	-	-	2 <sup>4</sup>
Line Cord Length, NEMA Plug		6ft, 5-15P	6ft, 5-15P	6ft, 5-15P	-	6ft, L5-15P	6ft, L5-30P	8ft, L6-30P

1. Data provided by APC.  
 2. How-to-Read example for 200-240(208): Input VAC is 200-240 as is the UPS output when electric service is active. When electric service is interrupted and the UPS is on battery, the UPS output is 208 VAC.  
 3. Battery output may be set to 220, 225, 230, or 240 VAC.  
 4. Two PDU jumper cables ship with the UPS for attachment from the IEC 320-C19 receptacles to Power Distribution Units (PDUs) with C20 inlets.  
 5. SU-5000RMiB (P/N 37L6862) contains a Terminal Block (TB) for direct attachment to an electrical source by qualified personnel.  
 6. Two IEC power cables are provided to attach devices to the UPS outlets, which are 1.8m long with IEC 320-C13 / C14 connectors.



Total Configuration Runtime Estimator (time in minutes) <sup>1</sup>								
	Tower				Rack Mount			
Int'l Part Number	SU-700iNET 94G4073	SU-1000iNET 94G4074	SU-1400iNET 94G4075	SU-2200iNET 94G4076	SU-1400RMiB 94G6675	2U SU-1400RMiB 32P1022	SU-3000RMiB 94G6677	SU-5000RMiB 37L6862
United States Part Number	SU-700NET 94G3134	SU-1000NET 94G3135	SU-1400NET 94G3136	Not Available	SU-1400RMB 94G6674	2U SU-1400RMB 32P1020	SU-3000RMB 94G6676	SU-5000RMB 37L6861
Total Load (Watts)	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes
200	22	38	62	130	45	45	104	240
250	17	28	43	104	34	34	84	200
300	12	22	34	85	25	25	70	166
350	9	18	29	71	22	22	58	145
400	7	14	23	65	18	18	52	125
450	5	12	20	52	15	15	45	110
500	-	11	18	43	13	13	38	97
550	-	9	16	38	11	11	35	87
600	-	8	13	34	10	10	31	76
650	-	7	12	31	9	9	29	68
700	-	6	11	28	8	8	26	63
750	-	-	10	25	8	8	24	59
800	-	-	9	23	7	7	22	55
850	-	-	8	21	7	7	20	51
900	-	-	7	19	6	6	18	47
950	-	-	6	18	5	5	17	43
1000	-	-	-	17	-	-	16	39
1100	-	-	-	15	-	-	14	34
1200	-	-	-	13	-	-	12	31
1300	-	-	-	11	-	-	10	28
1400	-	-	-	9	-	-	9	25
1500	-	-	-	9	-	-	8	22
1600	-	-	-	8	-	-	8	20
1700	-	-	-	-	-	-	7	18
1800	-	-	-	-	-	-	-	17
1900	-	-	-	-	-	-	-	14
2000	-	-	-	-	-	-	-	12
2100	-	-	-	-	-	-	-	11
2200	-	-	-	-	-	-	-	11
2300	-	-	-	-	-	-	-	10
2400	-	-	-	-	-	-	-	10
2500	-	-	-	-	-	-	-	9
2600	-	-	-	-	-	-	-	9
2700	-	-	-	-	-	-	-	8
2800	-	-	-	-	-	-	-	8

1. Data provided by APC.

Steps:

1. Identify the devices contained in the configuration.
2. Sum the load (watts) of all devices in the configuration. Use either Maximum Load for minimum runtime or Typical Load for typical runtime.
3. Find the Total Configuration Load in the table above.
4. Select the most appropriate UPS model to achieve the desired runtime.

<b>Tower or Rack Mount</b>			
<b>International</b>	<b>UPS3000XLV</b>	<b>UPS3000XHV</b>	<b>UPS Extend Run Battery Pack 32P1681</b>
<b>Part Number</b>	<b>32P1681</b>	<b>various</b>	<b>32P1692</b>
<b>United States</b>	<b>UPS3000XLV</b>	<b>UPS3000XHV</b>	<b>UPS Extend Run Battery Pack 32P1692</b>
<b>Part Number</b>	<b>2130R30</b>	<b>2130R31</b>	

<b>UPS Attributes</b>			
Communications Links to Servers	Serial/USB/Enet	Serial/USB/Enet	-
Color	black	black	black
EIA Height	2U	2U	2U
<b>Int'l Models</b>			
<b>50 or 60Hz, single phase, VAC:</b>	120(120) <sup>2</sup>	220-240(xxx) <sup>2, 3</sup>	-
10-Amp, IEC 320-C13 (Device) receptacles	6	7	-
16-Amp, IEC 320-C19 (PDU) receptacles	-	1 <sup>5</sup>	-
Receptacles (NEMA L5-20R)	1	-	-
Line Cord Length, NEMA Plug	9ft, L5-30P	-	-
Line Cord Receptacle (IEC 320-)	-	C20	-
<b>US Models</b>			
<b>50 or 60Hz, single phase, VAC:</b>	120(120) <sup>2</sup>	200-240(208) <sup>2</sup>	-
Receptacles (NEMA 5-15R)	-	-	-
Receptacles (NEMA L5-20R)	1	-	-
10-Amp, IEC 320-C13 (Device) receptacles	6 <sup>4</sup>	7 <sup>4</sup>	-
16-Amp, IEC 320-C19 (PDU) receptacles	-	1 <sup>5</sup>	-
Line Cord Length, NEMA Plug	9ft, L5-30P	-	-
Line Cord Receptacle (IEC 320-)	-	C20 <sup>6</sup>	-

1. Data provided by APC.
2. How-to-Read example for 200-240(208): Input VAC is 200-240 as is the UPS output when electric service is active. When electric service is interrupted and the UPS is on battery, the UPS output is 208 VAC.
3. Battery output may be set to 220, 225, 230, or 240 VAC.
4. Four IEC power cables are provided to attach devices to the UPS outlets, which are 2m long with IEC 320-C13 / C14 connectors.
5. One 2m PDU jumper cable ships with the UPS for attachment from the IEC 320-C19 receptacles to a Power Distribution Units (PDUs) with C20 inlets.
6. US line cord is 8ft (2.5m) long with NEMA L6-30P power plug.

**Steps:**

1. Identify the devices contained in the configuration.
2. Sum the load (watts) of all devices in the configuration. Use either Maximum Load for minimum runtime or Typical Load for typical runtime.
3. Find the Total Configuration Load in the table above.
4. Select the most appropriate UPS model to achieve the desired runtime.

NOTE: If the Total Configuration Load is greater than the entries above, split the load across two or more UPS units.



<b>Total Configuration Runtime Estimator (time in minutes)<sup>1</sup></b>					
	<b>Number of Battery Packs</b>				
	<b>Internal Only</b>	<b>+1</b>	<b>+2</b>	<b>+3</b>	<b>+4</b>
<b>Total Load (Watts)</b>	<b>Runtime Hours / Minutes</b>				
200	1 / 45	7 / 5	13 / 32	19 / 50	24 / 16
250	1 / 15	5 / 48	11 / 57	17 / 36	20 / 56
300	1 / 9	3 / 58	9 / 42	14 / 36	17 / 36
350	60	3 / 24	8 / 43	13 / 15	16 / 42
400	50	2 / 50	6 / 55	10 / 55	15 / 3
450	45.5	2 / 41	5 / 59	9 / 50	14 / 0
500	41.8	2 / 37	5 / 12	8 / 53	12 / 32
550	39	2 / 33	4 / 36	8 / 0	11 / 7
600	35.5	2 / 24	3 / 37	6 / 29	8 / 55
650	33.8	2 / 19	3 / 14	5 / 51	8 / 19
700	30.6	2 / 12	3 / 1	5 / 10	7 / 51
750	28	2 / 7	2 / 52	4 / 47	7 / 30
800	23.7	1 / 54	2 / 42	3 / 57	6 / 7
850	21.9	1 / 48	2 / 38	3 / 29	5 / 23
900	20	1 / 40	2 / 34	3 / 13	4 / 58
950	18.1	1 / 30	2 / 30	3 / 0	4 / 36
1000	15.5	1 / 20	2 / 21	2 / 52	3 / 46
1100	14.4	1 / 8	2 / 15	2 / 50	3 / 35
1200	13	1 / 1	2 / 8	2 / 43	3 / 9
1300	12.3	57.5	2 / 4	2 / 39	3 / 0
1400	10.9	53	1 / 54	2 / 32	2 / 49
1500	10	51.4	1 / 48	2 / 28	2 / 45
1600	8.4	48	1 / 35	2 / 19	2 / 39
1700	7.7	46.3	1 / 30	2 / 13	2 / 37
1800	6.85	42	1 / 15	2 / 0	2 / 30
1900	6.5	39.7	1 / 6	1 / 54	2 / 24
2000	6.2	37	1 / 2	1 / 48	2 / 18
2100	5.7	32.4	58	1 / 37	2 / 9
2200	5.5	30.8	56.3	1 / 33	2 / 75
2300	5.1	28.9	53.9	1 / 25	2 / 3
2400	4.9	28.2	53	1 / 21	1 / 59
2500	4.45	26.9	50.7	1 / 13	1 / 50
2600	4.2	26	49.4	1 / 9	1 / 46
2700	4	25.1	48.3	1 / 6	1 / 42
2800	3.8	24.2	47	1 / 2.5	1 / 39
2850	3.6	23.4	46	1 / 0	1 / 36

1. Data provided by APC.

Steps:

1. Identify the devices contained in the configuration.
2. Sum the load (watts) of all devices in the configuration. Use either Maximum Load for minimum runtime or Typical Load for typical runtime.
3. Find the Total Configuration Load in the table above.
4. Select the most appropriate battery pack column to achieve the desired runtime.

NOTE: If the Total Configuration Load is greater than the entries above, split the load across two or more UPS units.



# Appendix D: SCSI Cables - Storage Units - Controllers

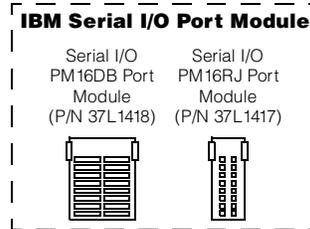
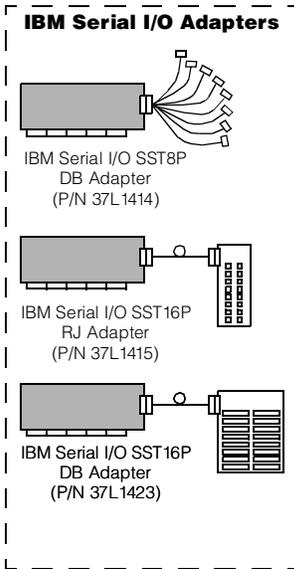
F: Female - External M: Male - External I: Internal 68: 16-bit, 68-pin High Density connector 50: 8-bit, 50-pin Centronix Connector 08: 16-bit, 68-pin Very High Density Connection Interface (VHDCI) 0.8mm connector 16: 16-bit, 68-pin connector 8: 8-bit, 50-pin connector			Instructions: Identify Desired Controller Row and Storage Unit Column. The intersection of row and column contains the cable group letter which supports the connection. Go to the cable group under the corresponding storage unit for specific support. Read all Notes for row, column, and any cable group footnotes.									
			Storage Unit		<b>35311RU</b>	<b>3510020</b>	<b>3503B1X</b>	<b>3551001</b>	<b>003480X</b>	<b>360716X</b>	<b>4560SLX</b>	
			Max MB/sec. <sup>1</sup>		160	-	-	-	80	80	80	
			LVDS		X	-	X	-	X	X	X	
			Connector Type		F0.8	F68	F68	F0.8	F0.8	F68	F0.8	
Description	Part Number	Max/Channel (MB/sec) <sup>1</sup>	LVDS	Connector Type/Max	Note #	2, 3	4, 5	4	2, 4	2, 4	3	2, 3
<b>RAID Storage Controllers</b>												
ServeRAID-4H Ultra160 SCSI Controller	37L6889	160	X	F0.8/4	6	A	-	-	-	-	-	-
ServeRAID-4Mx Ultra160 SCSI Adapter	06P5736	160	X	F0.8/2	6	A	-	-	-	-	-	-
ServeRAID-4Lx Ultra160 SCSI Adapter II	06P5740	160	X	F0.8/1	6	A	-	-	-	-	-	-
ServeRAID-5i Controller	25P3492	160	X	F0.8/1	7	A	B	-	A	A	-	-
<b>Ultra320 SCSI Controller</b>												
xSeries 225	Onboard	320	X	F0.8/1	11	A <sup>12</sup>	B	-	-	-	B	-
xSeries 235	Onboard	320	X	F0.8/1	11	A <sup>12</sup>	B	B	A	A	B	A
xSeries 345	Onboard	320	X	F0.8/1	-	A <sup>12</sup>	B	B	A	A	B	A
<b>Ultra160 SCSI Controllers</b>												
PCI Wide Ultra160 SCSI Adapter	19K4646	160	X	F0.8/1	-	-	B	B	A	A	B	A
xSeries 255	Onboard	160	X	F0.8/1	11	-	-	B	A	A	B	A
xSeries 440	Onboard	160	X	F0.8/1	-	-	-	B	A	A	-	A
<b>No Onboard External Port<sup>10</sup></b>												
xSeries 205	Onboard	-	-	n/a	-	-	-	-	-	-	-	-
xSeries 305	PCI adapter	-	-	n/a	-	-	-	-	-	-	-	-
xSeries 335	Onboard	-	-	n/a	-	-	-	-	-	-	-	-
xSeries 360	Onboard	-	-	n/a	-	-	-	-	-	-	-	-
<b>Cable Group A (M0.8-M0.8)</b>												
Netfinity 2m Ultra2 SCSI Cable	03K9310	-	X	M0.8-M0.8	8	X <sup>9</sup>	-	X <sup>14</sup>	X <sup>14</sup>	X <sup>14</sup>	-	X <sup>13</sup>
Netfinity 4.2m Ultra2 SCSI Cable	03K9311	-	X	M0.8-M0.8	8	X <sup>9</sup>	-	X <sup>14</sup>	X <sup>14</sup>	X <sup>14</sup>	-	X <sup>13</sup>
Netfinity 20m Ultra2 SCSI Cable	37L7101	-	X	M0.8-M0.8	6	X <sup>9</sup>	-	-	-	-	-	-
<b>Cable Group B (M68-M0.8)</b>												
2m External 0.8mm SCSI Cable	01K8027	-	-	M68-M0.8	-	-	X <sup>14</sup>	-	X <sup>14</sup>	-	X <sup>13</sup>	-
<b>Cable Group G (Other)</b>												
68-pin External Multimode LVD/SE SCSI Terminator	00N7956	-	-	M68	-	-	-	-	-	-	-	-

- Maximum supported speeds may be limited by installation of lower speed devices, controllers or cable lengths greater than two meters.
- Rack installation cable management requires devices to have a minimum cable length of two meters. Cable length requirements will vary based on placement within a single or multiple rack suite.
- Maximum speeds may be limited by the installed devices or SCSI controller.
- Daisy chaining tape enclosures is not supported at this time.
- Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
- Maximum speeds may be limited by the enclosure or its installed devices.
- ServeRAID-5i neither cables internally nor has its own external connector. In systems with an external SCSI connector cabled to channel B of the integrated storage controller, ServeRAID-5i can attach through the integrated controller to external SCSI HDDs (EXP300). ServeRAID-5i supports the following half-high tape drives when installed in an available internal media bay connected to channel B of a dual-channel integrated controller or installed in a supported external tape enclosure: 00N7991, 24P2396, 24P2398. When the RAID controller is configured, channel B is designated as a standard SCSI channel in order to support the tape drives.
- Supports attachment to Ultra2 or single-ended SCSI controllers with operational speeds of up to Ultra2. Controller, storage unit, cable length or storage device limitations may apply (see Max MB/sec row and column above).
- EXP300 (P/N 35311RU) includes a single 2M Ultra2 SCSI cable similar to Netfinity 2M Ultra2 SCSI Cable (P/N 03K9310).
- No external SCSI port is available on these systems. A supported optional controller must be installed. See the systems section to determine which controllers and external storage units are supported then refer back to this table for cable requirements using the controller row.
- Requires External SCSI Interface Kit (P/N 32P8164) to enable the external 0.8mm VHDCI port.
- Support for EXP300 connected to the external SCSI port requires installation of ServeRAID-5i (P/N 25P3492) and availability of one channel of the integrated Ultra320 controller.
- External storage cable is included standard with the enclosure.
- External storage cable is not included standard with the enclosure.

Cables - Storage Units - Controllers



# Appendix E: IBM Serial I/O



37L 1414	Serial I/O SST8P DB Adapter <sup>1, 5</sup>
37L 1415	Serial I/O SST16P RJ Adapter <sup>2, 5</sup>
37L 1423	Serial I/O SST16P DB Adapter <sup>3, 5</sup>
37L 1417	Serial I/O PM16RJ Port Module <sup>4</sup>
37L 1418	Serial I/O PM16DB Port Module <sup>4</sup>

- Intelligent serial I/O interface card providing eight DB-25 RS232 serial connections using an octopus cable. Support for all ports at 921.6Kbps simultaneously.
- Intelligent serial I/O interface card providing sixteen RJ-45 RS232 serial connections in a breakout box. Support for all ports at 115.2Kbps simultaneously.
- Intelligent serial I/O interface card providing sixteen DB-25 RS232 serial connections in a breakout box. Support for all ports at 115.2Kbps simultaneously.
- Port Modules and Multiplexer Sets attach to one or more Port Modules or Multiplexer Sets already attached to one of the cables. A maximum of four Port Modules or Multiplexer Sets may be attached to a single cable.
- Serial I/O Adapters are 32-bit PCI half length cards. A maximum of four Serial I/O adapters (in any combination) may be installed in a single host system.

# Appendix F: Internal Cabling Overview

For the latest product & technical information, refer to the Information Sources on pages 2 and 3.

System	IDE Connections				SCSI Connections									Media	Int RAID		
	IDE connector # <sup>1</sup>	connects to (as shipped)	std cable (IDE)	additional connectivity (IDE)	# standard SCSI controllers	standard SCSI controller type	onboard	# channels	channel name (letter)	internal (I) or external (E) connectors	type of connector	intended or standard connection	int SCSI cable (16-bit LVD)	terminated	optional connectivity (SCSI) <sup>13</sup>	media bay cable source <sup>5</sup>	Use std SCSI cable to connect RAID?
x205 IDE	1	CD-ROM	2-drop	1 optical, IDE tape or IDE HDD	-	-	-	-	-	-	-	-	-	-	-	19K4646 <sup>6</sup>	N/A
	2	IDE HDD	2-drop	1 HDD	-	-	-	-	-	-	-	-	-	-	-	-	-
x205 NH/S SCSI	1	CD-ROM	2-drop	1 optical	1	U160	Y	1	A	I	68-pin	1 NH/S SCSI HDD or open bay	5-drop	Y	3 NH/S HDDs, 1 HH tape <sup>4</sup>	std <sup>7</sup>	Y <sup>9</sup>
x205 H/S SCSI	1	CD-ROM	2-drop	1 optical	1	U160	Y	1	A	I	68-pin	H/S backplane	2-drop	N <sup>3</sup>	-	19K4646 <sup>8</sup>	Y <sup>10</sup>
x225 NH/S SCSI	1	CD-ROM	2-drop	1 optical or IDE tape	1	U320	Y	2	A	I	68-pin	1 NH/S SCSI HDD	4-drop	Y	3 NH/S HDDs	-	Y <sup>11</sup>
	-	-	-	-	-	-	-	-	B	I	68-pin	media bay <sup>19</sup>	-	-	HH tape	std w/ option	-
	-	-	-	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device <sup>19</sup>	-	-	-	-	-
x225 H/S SCSI	1	CD-ROM	2-drop	1 optical or IDE tape	1	U320	Y	2	A	I	68-pin	H/S backplane	1-drop	N <sup>3</sup>	-	-	Y <sup>11</sup>
	-	-	-	-	-	-	-	-	B	I	68-pin	media bay <sup>19</sup>	-	-	HH tape	std w/ option	-
	-	-	-	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device <sup>19</sup>	-	-	-	-	-
x235	1	CD-ROM	2-drop	1 optical	1	U320	Y	2	A	I	68-pin	H/S backplane	1 drop	N <sup>3</sup>	-	-	N <sup>22</sup>
	-	-	-	-	-	-	-	-	B	I	68-pin	media bays <sup>20</sup>	1 drop	Y <sup>21</sup>	HH or FH tape or U320 3-pack Kit	std w/ option	Y <sup>23</sup>
	-	-	-	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device <sup>20</sup>	-	-	-	-	-





System	IDE Connections				SCSI Connections										Media	Int RAID	
	1	CD-ROM	2-drop	1 optical	1	U160	Y	2	A	I	68-pin	H/S backplane	1-drop	N <sup>6</sup>			HH or FH tape, 6-pack kit <sup>24</sup>
x255	1	CD-ROM	2-drop	1 optical	1	U160	Y	2	A	I	68-pin	H/S backplane	1-drop	N <sup>6</sup>	HH or FH tape, 6-pack kit <sup>24</sup>	std w/ option	Y <sup>25</sup>
	-	-	-	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device	-	-	-	-	-
x305 IDE	1	CD-ROM	1-drop	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
	2	IDE-HDD	2-drop	1 IDE HDD	-	-	-	-	-	-	-	-	-	-	-	-	-
x305 SCSI	1	CD-ROM	1-drop	-	1	U160	N	1	A	I	68-pin	HDD or open bay	2-drop	Y	1 NH/S HDD	-	Y
x335 IDE	1	CD-ROM	1-drop	-	-	-	-	-	-	-	-	-	-	-	-	-	N/A
	2	IDE HDD	2-drop	1 IDE HDD	-	-	-	-	-	-	-	-	-	-	-	-	-
x335 H/S SCSI	1	CD-ROM	1-drop	-	1	U320	Y	1	A	I	68-pin	H/S backplane	1-drop	N <sup>3</sup>	-	-	Y
x343 (NEBS)	1	CD-ROM	1-drop	-	1	U160	Y	2	A	I	68-pin	1 NH/S SCSI HDD	2-drop	Y	-	-	-
	-	-	-	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device	-	-	-	-	-
x345	1	CD-ROM	1-drop	-	1	U320	Y	2	A	I	68-pin	H/S backplane	1-drop	N <sup>3</sup>	-	-	Y <sup>26</sup>
	-	-	-	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device	-	-	-	-	-
x360	1	CD-ROM	1-drop <sup>14</sup>	-	1	U160	Y	1	A	I	Integrated	H/S backplane <sup>19</sup>	-	-	-	-	Y <sup>16</sup>
x440	1	CD-ROM	n/a <sup>17</sup>	-	1	U160	Y	2	A	I	68-pin	H/S backplane	1-drop	N <sup>3</sup>	-	-	Y <sup>16</sup>
	2	FDD	n/a <sup>17</sup>	-	-	-	-	-	B	E	0.8mm VHDCI	ext SCSI device	-	-	-	-	-

1. IDE controllers have two channels, generally with one connector per channel. Standard IDE cables include two drops. Some IDE devices, e.g., a slim-line CD-ROM, use a single-drop ribbon cable, which is soldered to a backplane instead of using a connector at the device end of the cable.

2. The term drop refers to a device connector on a cable. The connector that attaches to the controller is not counted as a drop.

3. Termination is provided by the hot-swap backplane.

4. Attaching a SCSI tape drive to the same SCSI bus as the HDDs may reduce performance. Slim-line tape drives may be supported in bay four (see the system Tape Options section).

5. An additional cable to connect SCSI devices installable in internal removable media bays to the standard SCSI storage controller may be required when the standard SCSI cable is used to connect an optional RAID adapter. The necessary cable is provided in the option specified in this column, or if one of the following tape drives is the media device being connected, a 34in terminated SCSI cable is now provided with the tape option: 00N7990, 00N7991, 00N7992, 00N8015, 00N8016, 24P2396, 24P2398.

6. If installing an IDE tape drive, the standard IDE cable is used (maximum number of IDE optical drives or HDDs is reduced by one because only two IDE connectors are provided on each of the two IDE cables). If installing an internal SCSI device, a supported SCSI storage controller is required. The single-channel Ultra160 SCSI adapter (P/N 19K4646) includes a 16-bit five-drop terminated multimode SCSI cable and a 0.8mm VHDCI external connector.

7. If installing an IDE tape drive, the second connector of the standard IDE cable can be used. If installing a SCSI device, one connector of the five-drop SCSI cable can be used, which may adversely affect performance for the entire SCSI bus. Installing the tape drive on an independent bus requires an optional controller (P/N 19K4646) unless the HDDs are attached to a RAID controller.

8. Half-high SCSI devices installed in the media bay require an additional storage controller (P/N 19K4646), which provides a single SCSI and a five-drop terminated cable.

9. In nonhot-swap models, SCSI RAID adapters are connected to one end of the standard SCSI cable. When the standard cable is used to attach to the RAID adapter, media bay attachment to the standard SCSI controller for SCSI devices in the x200 and nonhot-swap models of the x205 and x220 require the one-drop terminated LVD cable provided with the tape drive.

10. SCSI RAID adapters are generally connected to the hot-swap backplane using the standard cable that connects the integrated storage controller. When the standard cable is used for RAID attachment, media bay attachment requires the one-drop terminated LVD cable provided with the tape drive.

11. In xSeries 225, the standard cable connecting either the hot-swap backplane or the nonhot-swap HDDs is used to connect the HDDs to ServeRAID-4H, -4Mx or -4Lx. If ServeRAID-5i is installed, a cable is not required and both channels of the integrated controller are managed by the adapter.

12. Attachment of SCSI devices in either (or both) of the two available media bays requires a supported optional SCSI storage controller (P/N 19K4646) in non-RAID configurations. Two half-high or one full-high device may be installed. A two-drop SCSI cable is included with the server, which can be used to attach one or two internal tape options to the integrated controller when a ServeRAID adapter is used to support the hot-swap backplane.

13. Attachment of tape or optical drives to RAID adapters is not supported.

14. The standard slim-line CD-ROM docks directly into a media interposer card that is routed through the lightpath card before terminating at the planar.

15. The hot-swap backplane is connected to the integrated controller through a SCSI bus integrated into the system planar.

16. Internal RAID configurations are supported by connecting an internal connector on the RAID controller to a connector on the planar located between slot one and the memory card using a dedicated RAID cable provided with the system. (Route cable underneath PCI adapters.) Note: If the hot-swap backplane is attached to a RAID adapter, a full-length adapter cannot be installed in slot one.

17. xSeries 440 ships with a slim-line UltraBay 2000 CD-ROM installed in bay 4 (lower right of four bays) and an UltraBay 2000 floppy disk drive (FDD) installed in bay three. An optional UltraBay 2000 CD-RW and high-density FDD are available. FDDs can be installed in bay three only, but optical devices can be installed in either bay. If only one optical device is installed, it must be located in bay four. If two are installed, the standard FDD is removed and the second device is installed in bay three configured as slave.

18. If the hot-swap backplane is attached to a RAID adapter, the standard SCSI cable is replaced by a longer cable shipped with the system.

19. Channel B may be connected to a supported tape drive installed in the media bay if ServeRAID-5i is installed and channel B is designated to support SCSI during the setup or if RAID is not implemented (cable shipped with tape drive is used). If channel B is available, a 0.8mm VHDCI external SCSI port can be enabled by installing External SCSI Interface Kit (P/N 32P8164). The external port is then operated as a SCSI channel supporting external tape storage or as a RAID channel supporting external HDD storage.

20. This channel may be connected to either a supported tape drive or the Ultra320 3-pack Kit (P/N 33P2751) installed in the media bays. If no internal connection is established, the 0.8mm VHDCI external SCSI port can be enabled by installing External SCSI Interface Kit (P/N 32P8164).

21. Termination is provided by the one-drop cable included with the tape option or by the optional hot-swap backplane when the Ultra320 3-pack Kit is installed, which includes a nonterminated cable.

22. Optional 30in nonterminated Single-drop Internal LVD Ultra160 SCSI Cable (P/N 71P8995) is required to connect the hot-swap backplane to ServeRAID-4H, -4Mx or -4Lx. ServeRAID-5i does not require a cable.

23. If the optional Ultra320 3-pack Kit (P/N 33P2751) is installed in the media bays, the cable that ships with the option is used to connect to ServeRAID-4H, -4Mx or -4Lx or to the integrated controller if ServeRAID 5i is installed.

24. An optional 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163) can be installed above the standard six hot-swap HDD bays and a full-high or half-high tape drive can be installed in the available media bays.

25. SCSI RAID adapters are generally connected to the hot-swap backplane using the standard cable that connects the integrated storage controller. When the standard cable is used for RAID attachment, media bay attachment requires another



supported cable, e.g., the two-drop terminated LVD cable provided in the Media Bay Tray and LVD Cable Kit (P/N 10K2340) unless one of the following tape drives is the media device being connected, which now include a 34in terminated SCSI cable: 00N7990, 00N7991, 00N7992, 00N8015, 00N8016, 24P2396, 24P2398. Attachment of optional 6-pack Ultra320 Hot-swap Expansion Kit (P/N 32P8163) connects to a RAID adapter using the cable that ships with the option.

26. If ServeRAID-5i is installed, the standard cable that connects the backplane to the integrated controller remains connected. If ServeRAID-4Mx or -4Lx support the internal HDD backplane, then optional 30in nonterminated Single-drop Internal LVD Ultra 160 SCSI Cable (P/N 71P8995) is required.

**For additional information, refer to the Internal SCSI Cabling and Tape Options sections for each system or to Appendix D: SCSI Cables - Storage Units - Controllers.**



# Appendix G: System Management Overview

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IBM system management solutions allow you to run your business-critical applications using innovative hardware technology that prevents most outages and recovers rapidly from the few that do occur. This technology makes xSeries simpler to service and easier to manage.

This section shows the available range of standard and optional system management processors and describes the features and configuration process for each. This section further demonstrates how these service processors can be interconnected to form a communication network for alerting and monitoring a wide range of system functions and hardware conditions.

<b>Key to abbreviations</b>	
ASMP	Advanced System Management Processor
ISMP	Integrated System Management Processor
ASMA	Advanced System Management PCI Adapter (P/N 01K7209)
RSA	Remote Supervisor Adapter (P/N 09N7585)
ASMIC	Advanced System Management Interconnect Cable Kit (P/N 03K9309)

## **General Notes:**

All descriptions of features and compatibility of ISMP described here require the use of firmware version 1.02 or newer. As of January 1, 2002, all ISMPs ship standard with firmware version 1.02. Firmware updates may be found on the IBM Web site at the URL [www.pc.ibm.com/qtechinfo/MIGR-4WEP53.html](http://www.pc.ibm.com/qtechinfo/MIGR-4WEP53.html).

An advanced system management interconnect network is configured with at least one focal point (generally an ASMA or RSA in a server) that provides Ethernet LAN and serial connections for management and alerting, which are shared between all the members of an interconnect network.

Up to 24 ISMPs and/or RSAs may be interconnected in a single ASM interconnect network (including standard and optional processors).

Up to 12 ASMPs and/or ASMA may be interconnected in a single ASM interconnect network (including standard and optional processors). Up to 12 additional ISMPs and/or RSAs may be added to an ASM interconnect network containing 12 or less ASMPs and/or ASMA.

An ASM interconnect network may contain an aggregate connection length of no more than 91.4m (300ft).

A customer-supplied Cat5 Ethernet cable is required for each interconnection.

Connecting servers that do not have two external RS-485 ports as an ASM interconnect network requires Advanced System Management Interconnect Cable Kit (P/N 03K9309). RSA and ASMA do not include this option when shipped standard with a system.

**System Management support by server**

xSeries Server	Onboard		PCI Adapter		Cabling
	ASMP <sup>1</sup>	ISMP <sup>1</sup>	ASMA <sup>2, 3, 4</sup>	RSA <sup>3, 5, 6</sup>	ASMIC <sup>7</sup>
x200 <sup>8</sup>	-	-	-	-	-
x205	-	-	-	optional <sup>9</sup>	-
x220	-	-	-	optional <sup>9</sup>	-
x225	-	-	-	optional <sup>9</sup>	-
x230	standard <sup>10, 11</sup>	-	optional <sup>11, 12</sup>	-	optional <sup>13</sup>
x232	-	standard <sup>14, 15</sup>	-	optional <sup>16, 17</sup>	-
x235	-	standard <sup>14, 18</sup>	-	optional <sup>16, 17</sup>	-
x240	standard <sup>10, 11</sup>	-	optional <sup>11, 12</sup>	-	optional <sup>13</sup>
x250	standard <sup>14, 15</sup>	-	optional <sup>19, 20</sup>	-	-
x255	-	standard <sup>14, 18</sup>	-	optional <sup>16, 17</sup>	-
x300 <sup>8</sup>	-	-	-	-	-
x305	-	-	-	optional <sup>9</sup>	-
x330	standard <sup>14, 15</sup>	-	optional <sup>19, 20, 21</sup>	optional <sup>22, 23, 24</sup>	-
x335	-	standard <sup>18, 28</sup>	-	optional <sup>28</sup>	-
x340	standard <sup>10, 11</sup>	-	optional <sup>11, 12</sup>	-	optional <sup>13</sup>
x342	-	standard <sup>14, 15</sup>	-	optional <sup>16, 17</sup>	-
x345	-	standard <sup>14, 18</sup>	-	optional <sup>16, 17</sup>	-
x350	standard <sup>14, 15</sup>	-	optional <sup>19, 20</sup>	-	-
x360	-	-	-	standard <sup>25</sup>	optional <sup>26</sup>
x370	-	-	standard <sup>27</sup>	-	optional <sup>26</sup>
x440	-	-	-	standard <sup>25</sup>	optional <sup>26</sup>

1. This service processor is integrated into the system planar (onboard).
2. This adapter cannot be the remote management focal point in an interconnect network containing an RSA or ISMP. The ASM PCI adapter is only used as the focal point when an RSA or ISMP is not present (or not functioning) in the network. The focal point must be the latest generation of service processor connected within the network.
3. Adds alternate Ethernet LAN and serial connections for support when the operating system is not available.
4. Advanced System Management PCI Adapter (P/N 01K7209) includes the following: adapter card, dual serial cable, ASM interconnect dual pigtail cable, ASM interconnect single pigtail cable, internal ASM interconnect knockout cable, AC adapter and power cord, power cable with C13 connector for UPS attachment, and a 1ft Cat5 cable. When ASMA is supplied standard (e.g., with xSeries 370), the optional ASM Interconnect Cable Kit (P/N 03K9309) is required in order to enable ASM interconnect.
5. RSA provides ASM Web interface using HTTP protocol; SNMP, DNS, PPP and DHCP network support; E-mail alerting; full remote graphical console redirection; blue-screen error information capture for Windows NT and 2000; and network flashing of host firmware for system BIOS and Advanced System Management firmware.
6. Remote Supervisor Adapter (P/N 09N7585) includes the following: adapter card, 20-pin ribbon cable, AC power adapter, power cable, power cable for UPS attachment, single pigtail cable, two RS-485 terminators and 1ft Cat5 cable. When RSA is shipped standard with a system (e.g., xSeries 360), optional ASM Interconnect Cable Kit (P/N 03K9309) is required to enable ASM interconnect.
7. Advanced System Management Interconnect Cable Kit (P/N 03K9309) includes an internal ASM interconnect knockout cable, an ASM interconnect single pigtail cable and an RS-485 terminator.
8. These xSeries servers support system management with IBM Director only, without ASM interconnect support.
9. This configuration is shown in interconnect scenario 4, appearing later in this section.
10. This configuration is shown in interconnect scenario 8, appearing later in this section.
11. Connecting xSeries 230, 240 or 340 servers in an ASM interconnect network requires Advanced System Management Interconnect Cable Kit (P/N 03K9309).
12. This configuration is shown in interconnect scenario 9, appearing later in this section.
13. Advanced System Management Interconnect Cable Kit is not required for servers with built-in RS-485 interconnect ports or for servers configured with optional Advanced System Management PCI Adapter (P/N 01K7209) or Remote Supervisor Adapter (P/N 09N7585).
14. This configuration is shown in interconnect scenario 1, appearing later in this section.
15. The system includes two external integrated RS-485 ports located on the rear of the chassis, which precludes the requirement for the ASMIC kit option.
16. This configuration is shown in interconnect scenario 5, appearing later in this section.
17. When RSA is installed in an xSeries 232, 235, 255, 342 or 345, the onboard service processor is managed by RSA. All signaling and power are transmitted through the 20-pin ribbon cable, and an external Cat5 connection between the RSA and the integrated RS-485 port on the chassis is not installed. Connection of the external power supply is not required.
18. The standard ISMP in x235, x255, x335 and x345 has enhanced functionality, described on the System Management Functional Comparison appearing later in this section.



19. This configuration is shown in interconnect scenario 6, appearing later in this section.  
 20. When ASMA is installed in this system, the optional adapter serves only as an Ethernet and interconnect gateway. The onboard ASM processor will provide all service processor data.  
 21. Supported only in machine type 8654 models of x330 systems.  
 22. This configuration is shown in interconnect scenario 7, appearing later in this section.  
 23. When installing in xSeries 330 machine type 8654 models, do not connect the 20-pin cable. Power is supplied through the external AC power supply that is provided with the option. When installing in xSeries 330 machine type 8674 or 8675 models, connect the 20-pin ribbon cable to provide the adapter with power. The AC power supply is not required.  
 24. When RSA is installed in this system, the optional adapter serves only as an Ethernet and interconnect gateway. The onboard ASM processor will provide all service processor data.  
 25. This configuration is shown in interconnect scenario 3, appearing later in this section.  
 26. Required to connect the standard adapter to other servers in an interconnect network.  
 27. This configuration is shown in interconnect scenario 2, appearing later in this section.  
 28. xSeries 335 includes new interconnect cabling options available through the C2T Interconnect cable chaining connection. One integrated RS-485 port is available for connecting the integrated ISMP to an optional RSA when that system is used as a system management interconnect network focal point. Interconnect network connections are then established through the cable chaining connection for additional x335 systems. The external AC power supply provided with RSA is not required. See Rack Cabinets and Options or system sections for additional information regarding console connectivity.

## System Management Functional Comparison

Feature/Function	Onboard		PCI Adapter	
	ASMP	ISMP <sup>1</sup>	ASMA <sup>2</sup>	RSA <sup>2, 3, 4</sup>
<b>Monitoring &amp; Alerting</b>				
Automatic server shutdown/restart	yes	yes	yes	yes
Environmental monitors (temperature, voltage)	yes	yes	yes	yes
Interface with Light Path Diagnostics	yes	yes	yes	yes <sup>5</sup>
PFA on system components (fans, power supplies, memory, etc.)	yes	yes <sup>6</sup>	yes	yes
Post, loader, OS timeouts	yes	yes	yes	yes
<b>Alert Mechanisms</b>				
Pager (numeric/alphanumeric) <sup>7</sup>	yes	no	yes	yes
Alert on LAN <sup>28</sup>	no	yes <sup>11</sup>	no	no
Director via LAN	yes <sup>10</sup>	yes <sup>10</sup>	yes	yes
Director via serial <sup>9</sup>	yes	no	yes	yes
E-mail	no	no	no	yes
Generate SNMP traps	yes <sup>10</sup>	yes <sup>10</sup>	yes	yes
<b>Management</b>				
Remote BIOS and SP firmware update <sup>12</sup>	yes	yes <sup>13</sup>	yes	yes <sup>14</sup>
Remote GUI-mode control	no	no	no	yes <sup>5, 15</sup>
Remote text-mode control	yes	no	no	yes
Remote POST and diagnostics <sup>12</sup>	yes	no	yes	yes <sup>16, 17</sup>
View status logs	yes	no	yes	yes
View vital product data	yes	no	yes	yes
Capture Windows blue screens	no	no	no	yes <sup>15</sup>
View SP configuration	no	no	yes	yes
Set SP configuration	no	no	no	yes <sup>14</sup>
Save and restore SP configuration	no	no	no	yes <sup>15</sup>
Restart SP	no	no	yes	yes
<b>Connectivity &amp; Cabling</b>				
IBM Director <sup>18</sup>	yes	yes	yes	yes
ANSI terminal <sup>9</sup>	yes	no	yes	yes
Telnet	yes <sup>19</sup>	no	yes	yes
Web interface	yes <sup>19</sup>	no	yes	yes
10/100 Ethernet	yes <sup>20</sup>	yes <sup>11</sup>	yes	yes
DHCP	no	no	no	yes
DNS	no	no	no	yes
PPP <sup>7</sup>	no	no	no	yes
Dedicated serial port	yes	no	dual <sup>21</sup>	yes
Shared serial port	yes	no	dual <sup>21</sup>	no
Redundant external power	no	no	yes	yes

1. This table is correct only for ISMP firmware v1.02 or newer. Systems shipped after January 1, 2002 include v1.02 firmware. Firmware updates are available on the Web at the URL [www.pc.ibm.com/qtechinfo/MIGR-4WEP53.html](http://www.pc.ibm.com/qtechinfo/MIGR-4WEP53.html).

2. When either RSA or ASMA are integrated as a standard adapter in an xSeries server (e.g., x360 or x440), the two interconnect cables, external power supply and power cords provided with the optional packages are not included.

3. When an optional RSA (P/N 09N7585) is installed in a system with standard ISMP, the optional adapter manages the onboard service processor and assumes all communications functionality.

4. When an optional RSA (P/N 09N7585) is installed in a system with standard ASMP, the optional adapter serves only as an Ethernet and interconnect gateway. The onboard ASMP provides all service processor data. An external Cat5 connection is required.

5. Not available when RSA is added as an option to systems with standard ASMP (e.g., x330).

6. Performs monitoring capability only. Automated alerting available through IBM Director only.

7. Requires customer-supplied external modem.

8. Only available with IBM Director version 3.1 or newer.

9. Requires customer-supplied external modem or null-modem cable.

10. The specified alerting mechanisms may be configured, but sending such alerts to their destination requires connection through an RSA or ASMA either within the local machine or via the interconnect network.

11. This functionality is only available on xSeries 235 and 255 servers, which include ISMP upgraded with a dedicated gigabit Ethernet processor.

12. Requires an out-of-band connection such as a serial, Ethernet or ASM interconnect network (out-of-band connections bypass the NOS and are established even when the NOS is not functioning).

13. Only updates to the the service processor firmware are possible. BIOS firmware updates are not available when using ISMP.

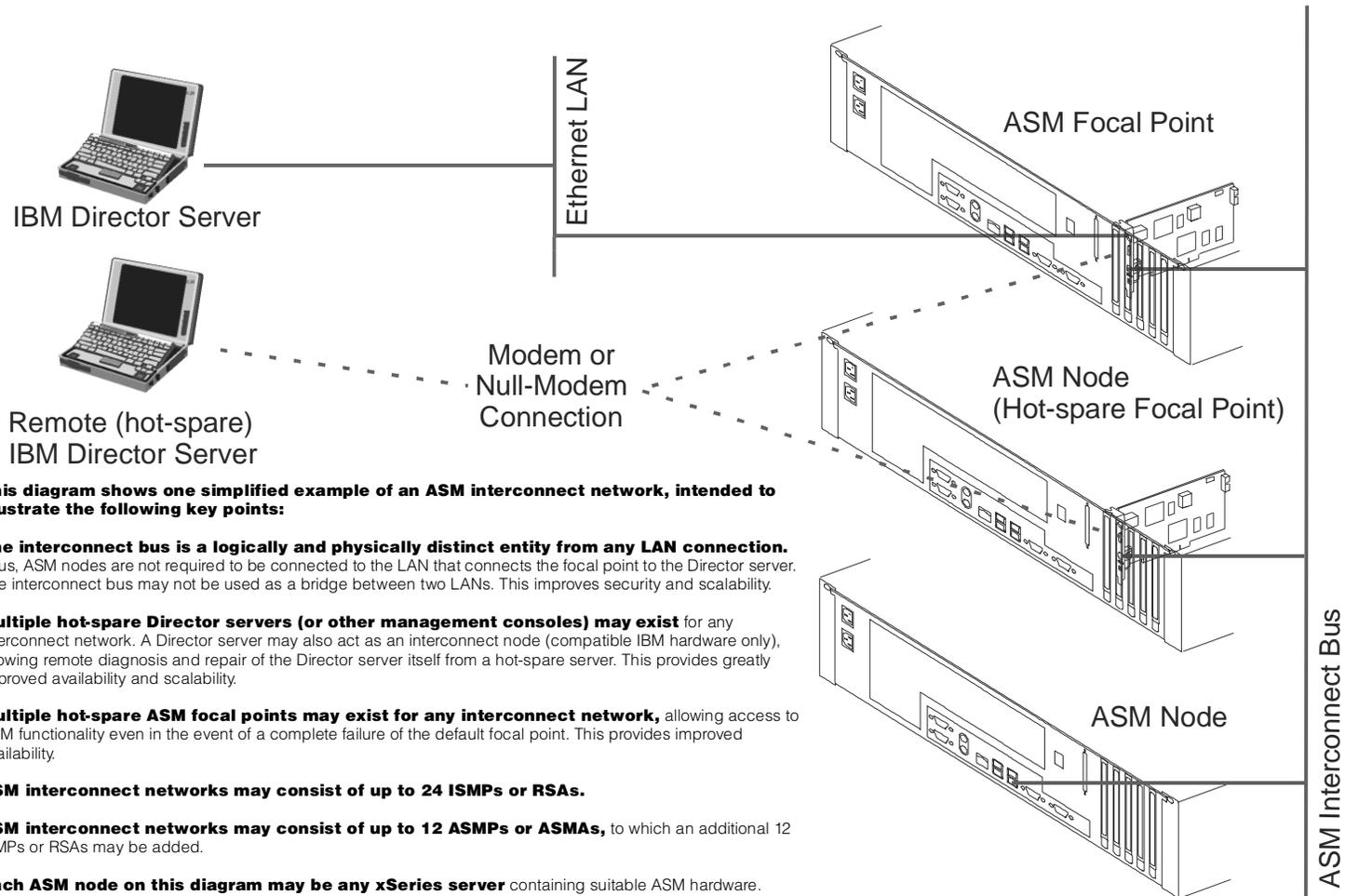
14. Only available through the Web interface, connected via Ethernet or PPP.

15. Only available through the Web or Telnet interface, via an Ethernet connection.



16. Not available via interconnect network.
17. Not available on systems without standard system management to which an optional RSA has been added (e.g., x220).
18. Connection to IBM Director allows use of all management and alerting functionality (except save and restore configuration file) via an active in-band, out-of-band or interconnect network connection.
19. Connection using Telnet, Web interface or Ethernet is available via an RSA or ASMA through the interconnect network.
20. Requires interconnection of integrated service processor to optional ASMA or RSA using an Interconnect Cable Kit (P/N 03K9309).
21. Requires the use of the included serial port splitter cable.

# Sample ASM Interconnect Network Schematic



**This diagram shows one simplified example of an ASM interconnect network, intended to illustrate the following key points:**

**The interconnect bus is a logically and physically distinct entity from any LAN connection.** Thus, ASM nodes are not required to be connected to the LAN that connects the focal point to the Director server. The interconnect bus may not be used as a bridge between two LANs. This improves security and scalability.

**Multiple hot-spare Director servers (or other management consoles) may exist** for any interconnect network. A Director server may also act as an interconnect node (compatible IBM hardware only), allowing remote diagnosis and repair of the Director server itself from a hot-spare server. This provides greatly improved availability and scalability.

**Multiple hot-spare ASM focal points may exist for any interconnect network,** allowing access to ASM functionality even in the event of a complete failure of the default focal point. This provides improved availability.

**ASM interconnect networks may consist of up to 24 ISMPs or RSAs.**

**ASM interconnect networks may consist of up to 12 ASMPs or ASMAs,** to which an additional 12 ISMPs or RSAs may be added.

**Each ASM node on this diagram may be any xSeries server** containing suitable ASM hardware.

For more detailed information on specific system management capabilities and configurations, see the cabling scenarios and service processor comparison tables in this appendix.

## xSeries Advanced System Management Interconnect Network Scenarios

## Configuration

## Interconnect hardware connections

**1. Server with ASMP or ISMP and two integrated RS-485 ASM interconnect ports on the rear of the chassis****Key Features:**

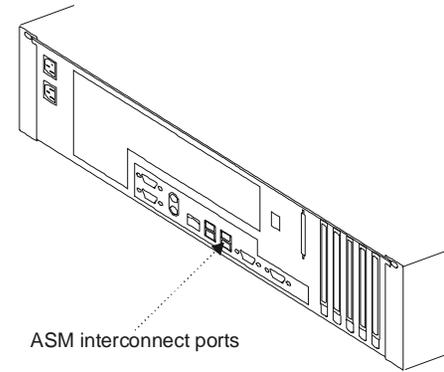
- Allows standard system management functionality, including remote flash update of BIOS and adapter microcode, remote hardware diagnostics, and monitoring and alerting of critical voltage and temperature thresholds.
- Remote BIOS update only available on ASMP.
- Only includes ISMP with firmware v1.02 or later.

**Servers:**

xSeries 232, 235, 250, 255, 330, 342, 345, 350

**Instructions:**

1. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the integrated RS-485 ports at the rear of the server. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.

**2. Server with standard ASMA****Key Features:**

xSeries 370 ships standard with ASMA, which provides all basic system management functionality including remote management via Telnet or a Web interface.

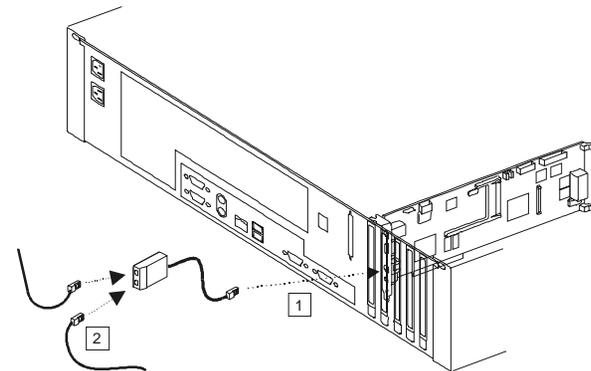
Requires purchase of ASM Interconnect Cable Kit (P/N 03K9309).

**Servers:**

xSeries 370

**Instructions:**

1. Insert pigtail cable into RS-485 interconnect port on adapter panel.
2. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the integrated RS-485 ports of the pigtail adapter. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.



### 3. Server with standard RSA

#### Key Features:

xSeries 360 and 440 ship standard with RSA, which provides the latest generation of system management functionality. In addition to standard system management capabilities, RSA adds advanced features such as full remote operation of server NOS, advanced Ethernet features and system management access even in the event of a complete server NOS failure.

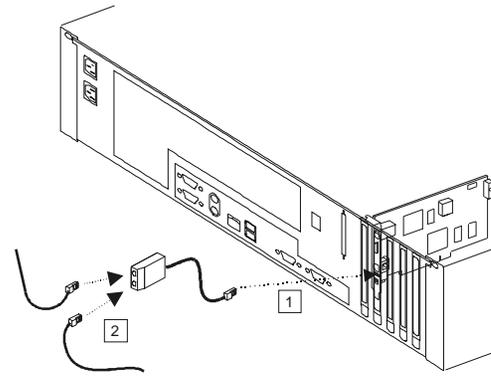
Requires purchase of ASM Interconnect Cable Kit (P/N 03K9309).

#### Servers

xSeries 360, 440

#### Instructions:

1. Insert pigtail cable into RS-485 ASM interconnect port on rear of adapter.
2. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the RS-485 ports of the pigtail adapter. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.



### 4. Server with no standard service processor and optional RSA

#### Key Features:

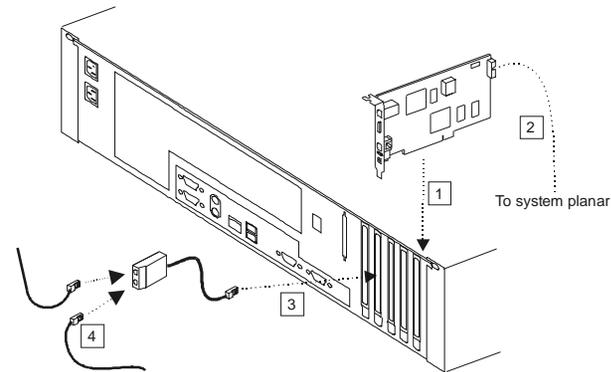
xSeries 220 ships standard without system management capability. To enable system management, an optional Remote Supervisor Adapter (P/N 09N7585) is required.

#### Servers:

xSeries 205, 220, 225

#### Instructions:

1. Insert RSA into PCI slot on system planar (see system I/O section for slot restrictions).
2. Connect 20-pin ribbon cable between system planar and RSA. xSeries 220 requires the external AC power supply.
3. Insert pigtail cable into RS-485 interconnect port on adapter panel.
4. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the RS-485 ports of the pigtail adapter. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.



### 5. Server with ISMP plus optional RSA

#### Key Features:

Adding an RSA to a server containing an ISMP merges their functionality. The RSA manages the ISMP and handles communications.

Only applicable to ISMP with firmware v1.02 or later

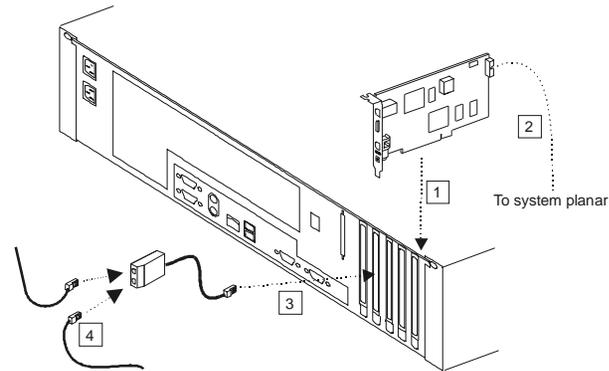
#### Servers

xSeries 232, 235, 255, 335 (see note below), 342, 345

#### Instructions:

1. Insert RSA into PCI connector on System Planar (see system I/O section for slot restrictions).
2. Connect 20-pin ribbon cable between system planar and RSA.
3. Insert pigtail cable into RS-485 port on adapter panel.
4. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the RS-485 ports of the pigtail adapter. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.

Note: Refer to x335 I/O Options for more information on C2T Interconnect cable chaining technology connections supporting system management.



### 6. Server with standard ASMP and two integrated RS-485 ASM interconnect ports on the rear of the server chassis, into which an ASMA is installed

#### Key Features:

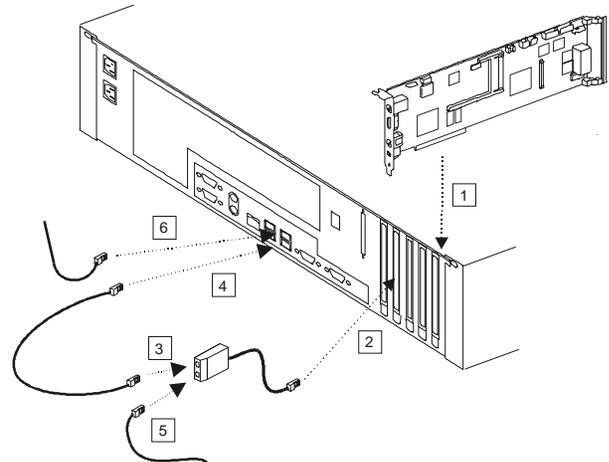
Adding an ASMA to a server containing an ASMP enables the ASMP to access the additional communication methods available on ASMA hardware. The ASMP retains full control of the system management role, with the ASMA acting as a gateway between system management and Ethernet. Requires purchase of optional ASM PCI Adapter (P/N 01K7209).

#### Servers:

xSeries 230, 330 (8654 models), 350

#### Instructions:

1. Install ASMA into PCI slot on system planar (see system I/O section for slot restrictions).
2. Plug the pigtail adapter into the RS-485 interconnect port of the ASMA.
3. Attach one end of the 1ft Cat5 cable (included with the ASMA option) to one of the RS-485 ports of the pigtail cable.
4. Attach the other end of the included 1ft Cat5 cable to one of the RS-485 ports built into the chassis.
5. Attach the customer-supplied Cat5 cable into the other RS-485 port of the pigtail cable.
6. If interconnection to a second ASM interconnect node is required, plug a second interconnect cable into the available integrated RS-485 port at the rear of the chassis. Otherwise, the second RS-485 port should be terminated using the supplied RS-485 terminator.
7. Connect the external AC power supply provided with the option.



### 7. Servers with standard ASMP and two integrated RS-485 ASM interconnect ports on the rear of the server chassis, into which an RSA is installed

#### Key Features:

Adding an RSA to a server containing an ASMP enables the ASMP to access the additional communication methods available on RSA hardware. The ASMP retains full control of the system management role, with the RSA acting as a gateway between system management and Ethernet.

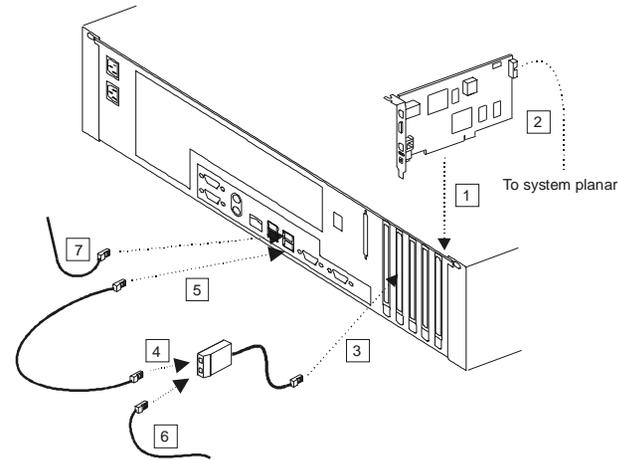
Requires purchase of optional Remote Supervisor Adapter (P/N 09N7585).

#### Servers:

xSeries 330 (except 8654 models)

#### Instructions:

1. Connect the RSA in a compatible PCI slot on the planar.
2. Connect 20-pin ribbon cable between system planar and RSA.
3. Plug the pigtail adapter into the RS-485 port of the RSA.
4. Attach one end of the 1ft Cat5 cable (included with the RSA option) to one of the RS-485 ports of the pigtail cable.
5. Attach the other end of the included 1ft Cat5 cable to one of the RS-485 ports built into the chassis.
6. Plug one ASM interconnect cable into the available RS-485 port of the pigtail cable.
7. If interconnection to a second ASM interconnect node is required, plug a second interconnect cable into the available integrated RS-485 port at the rear of the chassis. Otherwise, the second RS-485 port should be terminated using the supplied RS-485 terminator.



### 8. Server with ASMP and no standard RS-485 ports

#### Key Features:

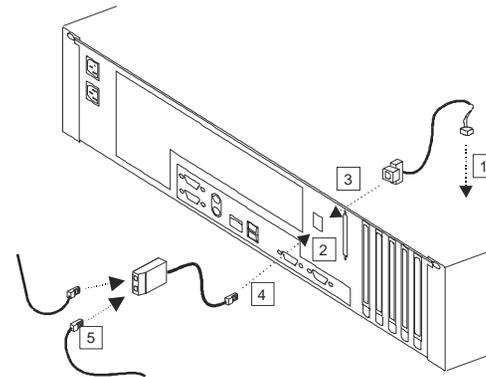
Enables basic ASM functionality for certain legacy systems.  
Requires purchase of ASM Interconnect Cable Kit (P/N 03K9309).

#### Servers:

xSeries 230, 240, 340

#### Instructions:

1. Connect interconnect knockout cable to the ASMP connector on the system planar.
2. Create knockout space on rear of system chassis.
3. Fix knockout fitting into place.
4. Plug single pigtail cable into knockout cable port.
5. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the RS-485 ports of the pigtail adapter. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.



### 9. Server with ASMP and no standard RS-485 ports, into which an optional ASMA is installed

#### Key Features:

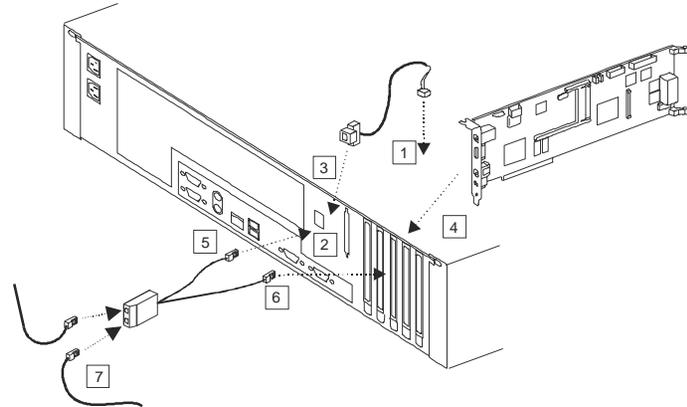
Enables basic ASM functionality for certain legacy systems.

#### Servers:

xSeries 230, 240, 340

#### Instructions:

1. Connect interconnect knockout cable to the ASMP connector on the system planar.
2. Create knockout space on rear of system chassis.
3. Fix knockout fitting into place.
4. Connect the ASMA to a compatible PCI slot on the planar.
5. Plug one pigtail cable into knockout cable port.
6. Plug other pigtail cable into the RS-485 port of ASMA.
7. Attach customer-supplied Cat5 cables (for connection to one or two other ASM interconnect nodes) to the RS-485 ports of the pigtail adapter. Unused RS-485 ports must be terminated with the supplied RS-485 terminator.
8. Connect the external AC power supply provided with the option.





# Appendix H: xSeries I/O Option Attributes

## I/O Option Attributes

Part Number	Description	Adapter Length	PCI Support <sup>1</sup>	Low-profile Enabled	Hot-Plug <sup>2</sup>	PCI Voltage Key	MHz <sup>1</sup>
<b>Storage Controllers</b>							
37L6889	ServeRAID-4H Ultra160 SCSI Controller <sup>3</sup>	Full	64-bit	-	X	Universal	33
06P5736	ServeRAID-4Mx Ultra160 SCSI Controller <sup>4</sup>	Full	64-bit	-	X	Universal	66
06P5740	ServeRAID-4Lx Ultra160 SCSI Controller <sup>5</sup>	Half	64-bit	-	X	Universal	66
25P3492	ServeRAID-5i Controller <sup>6</sup>	Full	64-bit	X	-	Universal	66
71P8592	ATA133 RAID Controller <sup>8</sup>	Half	32-bit	-	-	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter <sup>9</sup>	Half	32-bit	X	-	Universal	66
<b>Fibre Storage Controllers and Options<sup>10</sup></b>							
00N6881	Netfinity FASiT Host Adapter	Half	64-bit	-	X	Universal	66
24P0960	FC2-133 Host Bus Adapter <sup>29</sup>	Half	64-bit	X	X	Universal	133 <sup>30</sup>
174290U	FASiT900 Storage Server (US line cord)	-	-	-	-	-	-
17421RU	FASiT700 Fibre Channel Storage Server	-	-	-	-	-	-
35521RU	FASiT500 Storage Server	-	-	-	-	-	-
35421RU	FASiT200 Storage Server	-	-	-	-	-	-
35422RU	FASiT200 HA Storage Server	-	-	-	-	-	-
3534F08	TotalStorage SAN Switch F08 - 8-port (2Gb)	-	-	-	-	-	-
2109F16	SAN Fibre Channel Switch, 16-Port (2Gb)	-	-	-	-	-	-
2108R3L	SAN Data Gateway Router Ultra SCSI LVD Port <sup>11</sup>	-	-	-	-	-	-
<b>Networking</b>							
<b>Ethernet<sup>12</sup></b>							
22P4501	Intel Pro/100S Desktop Adapter <sup>13</sup>	Half	32-bit	-	-	Universal	33
22P4701	Intel Pro/100S Low Profile Desktop Adapter <sup>13</sup>	Half	32-bit	X	-	Universal	33
22P6501	Pro/1000 T Desktop Adapter by Intel <sup>14</sup>	Half	32-bit	-	-	Universal	33
22P6601	Intel Pro/1000 Low Profile Desktop Adapter <sup>14</sup>	Half	32-bit	X	-	Universal	33
22P6901	Wireless LAN Adapter	Half	128-bit	X	-	Universal	33
06P3601	10/100 Ethernet Server Adapter <sup>14</sup>	Half	32-bit	-	X	Universal	33
22P4901	10/100 Dual Port Server Adapter <sup>14</sup>	Half	64-bit	-	X	Universal	66
22P6801	PRO/1000XT Server Adapter by Intel (copper) w/CD, manuals <sup>14</sup>	Half	64-bit	-	X	Universal	133 <sup>30</sup>
22P7801	NetXtreme 1000 SX Fiber Ethernet Adapter <sup>28</sup>	Half	64-bit	X	X	Universal	133 <sup>30</sup>
31P6301	NetXtreme 1000 T Ethernet Adapter (copper) <sup>14, 28</sup>	Half	64-bit	X	X	Universal	133 <sup>30</sup>
<b>Token Ring</b>							
34L5001	16/4 Token-ring PCI Management Adapter <sup>14</sup>	Half	32-bit	-	X	Universal	33
34L5201	High-Speed 100/16/4 Token-ring PCI Management Adapter <sup>15</sup>	Half	32-bit	-	X	Universal	33
07P2701	16/4 Token-ring Low Profile PCI Management Adapter <sup>14</sup>	Half	32-bit	X	X	Universal	33
<b>System Management<sup>16</sup></b>							
03K9309	Advanced System Management Interconnect Cable Kit <sup>17</sup>	-	-	-	-	-	-
09N7585	Remote Supervisor Adapter <sup>18</sup>	Half	32-bit	-	-	Universal <sup>31</sup>	33
59P2984	Remote Supervisor Adapter II <sup>19</sup>	Half	32-bit	-	-	Universal <sup>31</sup>	33
<b>Communications</b>							
33L4618	V90 PCI Data/Fax Modem <sup>20</sup>	Half	32-bit	-	-	5	33
19K4162	V90 PCI Data/Fax WinModem (Low Profile Enabled) <sup>20, 29</sup>	Half	32-bit	X	-	Universal	33
37L14xx	Serial I/O SST 8- and 16-port adapters <sup>21</sup>	Half	32-bit	-	-	5	33
1519100	IXA Adapter <sup>22</sup>	Half	32-bit	-	-	Universal	-
22P5888	PCI Parallel Port Adapter (low profile)	Half	32-bit	-	-	5	33
<b>Remote I/O Expansion</b>							
8684-1RX	RXE-100 Remote Expansion Enclosure <sup>23</sup>	-	-	-	-	-	-



Related I/O Cables							
71P8995	Internal SCSI Interface Kit <sup>24</sup>	-	-	-	-	-	-
32P8164	External SCSI Interface Kit <sup>25</sup>	-	-	-	-	-	-
24P7929	Enabling Cable for External Ultra320 SCSI Port <sup>26</sup>	-	-	-	-	-	-
10K3661	USB to Serial Adapter <sup>27, 28</sup>	-	-	-	-	-	-
19K4164	NetVista USB - Parallel Printer Adapter <sup>27</sup>	-	-	-	-	-	-

1. Adapters rated at a lower frequency than the slots in which they are installed will reduce the bus to the frequency of the slowest adapter. 133MHz PCI-X adapters are backward compatible with 33/66MHz, 64-bit PCI-based servers.
2. Hot-plug feature only supported in systems with Active PCI slots. For network operating system support, point your browser to [www.pc.ibm.com/us/compat](http://www.pc.ibm.com/us/compat).
3. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266MHz PowerPC 750 processor and provides 128MB of battery-backed ECC cache with two internal and four external Ultra160 connectors (a combination of four connectors may be utilized). External connectors are 0.8mm VHDCI.
4. ServeRAID-4Mx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor that provides 64MB of battery-backed ECC cache and two internal and two external Ultra160 connections (only two connectors may be used simultaneously). External connectors are 0.8mm VHDCI.
5. ServeRAID-4Lx Ultra160 SCSI Controller is powered by a 100MHz Intel Zion GC80303 processor and provides a single channel, 32MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8mm VHDCI.
6. ServeRAID-5i (P/N 25P3492) supports both Ultra320 and Ultra160 HDDs in a dedicated or mixed environment, allowing each HDD to perform at rated capacity. The adapter installs into limited PCI slots and converts both channels of the integrated SCSI controller to RAID in conjunction with the LSI 1020/30 chipset. Both standard and the optional SCSI HDD backplanes as well as internal tape drives and external SCSI devices cable directly to the onboard controller connectors. Supports up to 528MB/s data transfers across the PCI bus with 128MB ECC SDRAM write-back cache with battery backup. Supports RAID levels 0, 1, 10, 5, 50 and 1E. The option includes brackets for installation in both low-profile and standard PCI slots. Internal and external tape drives are supported by ServeRAID-5i only when a second channel on the integrated controller is available and the RAID configuration designates the second channel as a conventional SCSI bus. See system sections for supported tape drives.
8. ATA133 RAID Controller (P/N 71P8592) supports RAID levels 0, 1 and 10 on up to four ATA66, 100 or 133 EIDE HDDs. The dual channel IDE controller includes two internal 40-pin connectors, two 18-inch single-drop IDE cables (P/N 02R0719) and two 23-inch two-drop IDE cables (P/N 02R0721).
9. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector, a five-drop multi-mode terminated LVD SCSI cable and one external 0.8mm VHDCI connector. Only one of the two connectors may be utilized. Hardware is included in the option to support either low-profile or full-size installations.
10. See Fibre Channel Solutions Overview section for additional configuration information.
11. The 2108R3L SAN Data Gateway Router UltraSCSI LVD Port provides one integrated short-wave optical port and two SCSI ports for tape storage connections (LVD, HVD and single-ended).
12. In a fault-tolerant networking environment, using the fault-tolerant software delivered with the Ethernet adapters of a single manufacturer is recommended. Installing fault-tolerant solutions provided by multiple manufacturers may cause failures if the intermediate drivers provided with the adapters are not compatible. See individual system I/O Options sections for additional information on adapter driver compatibility.
13. For use of the Alert on LAN 2 features in the Desktop adapter, the system must be enabled with IBM-compatible Alert on LAN 2 hardware and software components. Use of the Wake on LAN function requires a PCI 2.2 compatible system that supports Wake on LAN and provides auxiliary 3.3v power through the PCI bus.
14. Use of the Wake on LAN function requires a PCI 2.2 compatible system that supports Wake on LAN and provides auxiliary power through the PCI bus.
15. Use of the Wake on LAN function requires a PCI 2.1 or 2.2-compatible system that supports Wake on LAN and provides auxiliary power through the 5v Wake on LAN cable provided with the adapter via a 3-pin header in the system planar.
16. Up to 24 Integrated System Management Processors or Remote Supervisors Adapters may be interconnected with an aggregate connection length of no more than 91.4m (300ft). This interconnect network of 24 devices may also include a maximum of 12 Advanced System Management Processors or advanced System Management PCI Adapters. A customer-supplied Cat5 cable is required for each interconnection.
17. When a standard Remote Supervisor Adapter or ASM PCI Adapter is installed in a dedicated PCI slot with an external connector, support for connection to other servers in an ASM interconnect network requires an optional Advanced System Management Interconnect Cable Kit (P/N 03K9309). Where applicable, direct connection to the RXE drawer management controller in an RXE-100 Remote Expansion Enclosure is supported through a standard Interconnect Management Cable Kit with 3.5m cable (8m optional cable is available). Support is provided through a single LAN or modem connection.
18. Remote Supervisor Adapter (P/N 09N7585) includes an adapter card, 20-pin ribbon cable, AC power adapter, power cable, power cable for UPS attachment, single pigtail cable, two RS-485 terminators and 1ft Cat5 cable.
19. Remote Supervisor Adapter II (P/N 59P2984) includes an internal 20-pin ribbon cable for connection to the system planar, an interconnect cable, a 56w AC power adapter, an intrack power cable and a country-specific wall power cord. External connectors include an RS230 (9-pin) serial port, 10/100 base T Ethernet port (RJ-45), interconnect port (RJ-11) and power connector. The interconnect cable includes a single RJ-11 connector and dual RJ-48 ports. Supports an interconnect network of up to 24 RSAs or ISMPs with aggregate cable connection length of 300ft (91.4m) or less. No more than 12 ASMPs are supported in an interconnect network. RJ-45 bus is self-terminating, i.e., terminators are not required for the interconnect bus.
20. Due to homologation variances, modem availability differs by country.
21. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1423) may be installed.
22. Some xSeries servers support the IXA Adapter (P/N 1519100) for connection to iSeries models. Refer to system sections for PCI slot restrictions.
23. RXE-100 Remote Expansion Enclosure supports up to 12 additional PCI-X slots. Cable required for connection included with expansion unit, which attaches to a standard integrated RIO port located on the back of the system chassis. An optional longer cable is available. Refer to RXE-100 section for diagrams and supported options.
24. Required to connect ServeRAID-4H, -4Mx or -4Lx in xSeries 235 and ServeRAID-4Mx or -4Lx in xSeries 345 to the hot-swap backplane.
25. Required to enable external 0.8mm VHDCI connectors on some systems (x235, x255).
26. Required to enable external 68-pin high-density SCSI connector on some IntelliStation systems.
27. When supported, this option can be used for certain external device connections when only USB ports rather than serial or parallel ports are present on a system chassis.
28. Available only in the US.
29. The option includes brackets for installation in both low-profile and standard PCI slots.
30. This adapter is designed using PCI-X technology.
31. Although the voltage key of this adapter is universal (compatible with 3.3 or 5v slots), the BIOS of each system limits installation to a specific PCI slot.

xSeries I/O Option Attributes



# Important Notes

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