February 28th 2001

Configuration and Options Guide

EMEA

IBM @server xSeries

xSeries

Netfinity

Rack products

Fibre Channel

Storage Enclosures

Clustering

Cables

Options

@server PROVEN

xSeries 200

xSeries 220

xSeries 230 /
Netfinity 5100

xSeries 240 /
Netfinity 5600

Netfinity7100

Netfinity 7600

Netfinity 8500R

Netfinity 6000R

IBM Rack Enclosure

IBM FAStT EXP200
Storage Enclosure

xSeries 340 /
Netfinity 4500R

IBM FAStT EXP500
Storage Enclosure

xSeries 330

IBM NetBAY3

IBM EXP300
Storage Enclosure

xSeries 150

xSeries 130
xSeries 135

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Product Positioning	❒	❒	❒
Selection Guidance	❒	❒	❒
Business Model Summary	❒	❒	❒
Product Family Pages	❒	❒	❒
Sample Configurations	❒	❒	❒
Fibre Array Section	❒	❒	❒
Tape Drives Section	❒	❒	❒
UPS Runtimes Section	❒	❒	❒
Cabling Chart	❒	❒	❒

3. How would you rate the quality of information contained in the IBM Configuration and Options Guide?

   ❒ Too much
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5. Are you aware of the OrderBUILDER and Spreadsheet configurators that are available on PartnerInfo and the Web at URL: http://www.pc.ibm.com/europe/configurators

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IBM xSeries / Netfinity Configurator Team

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Changes in this Edition

CHANGE MADE	SECTION(S) IMPACTED
EXP200 REMOVED COMPLETELY	EXP200 SECTION AND THREE EXAMPLE PAGES IN FIBRE ARRAY SECTION REMOVED.
ADAPTER SLOT SUPPORT FOR NETWORK ADAPTERS AND STORAGE CONTROLLERS CLARIFIED FOR THE x200	x200 I/O SECTION CHART AND FOOTNOTES
ETHERNET ADAPTER P/N 34L0301 REMOVED (WITHDRAWN EFFECTIVE 09/02/01)	ALL PRODUCT SECTIONS - I/O CHART. REPLACEMENT ADAPTER IS P/N 06P3701
ADDED “FIBRE OPTIC CABLING INTERFACE” DESCRIPTION TO GIGABIT ETHERNET ADAPTER P/N 06P3701	ALL PRODUCT SECTIONS - I/O CHART
ADDED ETHERNET ADAPTER P/N 19K4401	x230, NF 7100 I/O CHARTS
ADDED TOKEN RING ADAPTER P/N 34L5201	x230 I/O/CHART
CLARIFICATION OF WHEN ADDITIONAL POWER SUPPLY IS NEEDED IN x230	x230 POWER, MONITORS, ACCESSORIES SECTION NOTE 1. AND TAPE OPTIONS SECTION NOTE 1.
REMOVED REMAINING MODELS WITHDRAWN IN 2000	NF 5100 - 21Y and 2RY NF 4500R - 1RY NF 7600 - 3RY
UPDATED WITHDRAWN MODELS AS ANNOUNCED ON 27/02/01 IN ZG01-0134 (EFFECTIVE 30/03/01)	x330 STANDARD MODEL - 11Y NF 4500R BUSINESS MODEL - 34G NF 4500R STANDARD MODEL - 3RY NF 5100 BUSINESS MODEL - 34G NF 5100 STANDARD MODELS - 31Y and 3RY
ADDED “WDFM” NOTE TO RECENTLY WITHDRAWN OPTIONS (LEFT IN THE COG FOR THE TIME BEING)	FIBRE ARRAY SECTION - P/N 01K7296 and P/N SFCU1xx RACK SECTION - CONSOLE SWITCHES P/N 28L0542 and P/N 94G7445 RACK SECTION - POWER DISTRIBUTION UNIT P/N 2PDUxxx

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Positioning of Configurator Aids

There are several sources of configuration assistance available which complement one another by providing aid at different levels and with different deliverables. Any combination of the configurators should be used depending on the situation. Always verify your hardware configurations with Network Operating System compatibility by accessing the ServerProven compatibility pages on the World Wide Web at URL http://www.pc.ibm.com/us/compat

OrderBUILDER Configurator: - a 32-bit Windows application, containing local part numbers and prices, enabling the user to configure systems for all PSG brands. Configurations can be added to a formatted Quote and then either printed directly from OrderBUILDER or exported to another application. OrderBUILDER is available in 31 country versions and update files containing latest part numbers and pricing are distribuuted regularly via the Web and Lotus Notes. See Distribution and Contact information below.

Spreadsheet Configurator:- a quick, easy to use tool that contains local part numbers and prices in 26 country/group versions. This tool enables the user to achieve most System and Rack configurations with onscreen guidance provided. It is available in either Microsoft Excel or Lotus 1-2-3 formats and updated versions are distributed monthly or inline with new product announcements via the Web and Lotus Notes.

Rack Configurator:- a graphical Windows application that can be used to configure solutions for the 42U and NetBAY22 Rack Units. It assists the user to decide optimum placement of items taking into account space, power and weight factors. It provides cabling recommendations and supplies detailed specification sheets, parts lists and floor plans. The Rack Configurator is updated inline with new product announcements (does not contain pricing) and is distributed in one European version, via the Web and Lotus Notes.

Configuration and Options Guide (this document!):- produced in Adobe Acrobat (.PDF) format that can be printed and used as hardcopy or viewed onscreen using Acrobat Reader. This configurator contains the complete range of currently marketed xSeries and Netfinity products and gives, for example, information on which options are required to achieve total amounts of memory or storage, while indicating pre-requisite items such as cables. This is a powerful, complete, yet easy to use tool that is produced in one European version. The COG is normally updated monthly inline with new product announcements (does not contain pricing) and is distributed in one European version, via the Web and Lotus Notes.

Tape Sizer - Total Cost of Ownership Tool:- this spreadsheet is intended to help evaluate the three-year total cost of ownership estimation for different tape formats, based on the following factors - drive performance, media usage, cartridge changing costs, cleaning frequency, cleaning cartridge usage. It is produced in Microsoft Excel format only, but can be loaded into Lotus 1-2-3, although formatting and use of navigation links will be affected. The pricing used for the comparison between different solutions is Estimated Selling Price (ESP).

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Configurator Distribution

All Users: Internet: http://www.ibm.com/pc/europe/configurators - OrderBUILDER Updates, latest versions of Spreadsheet Configurator, Configuration and Options Guide, Rack Configurator.

Business Partners: Lotus Notes PC PartnerInfo: Marketing Essentials Database - OrderBUILDER Updates, Spreadsheet Configurator, Configuration and Options Guide, Rack Configurator, Tape Sizer; Business Essentials Database - OrderBUILDER Updates, Spreadsheet Configurator.

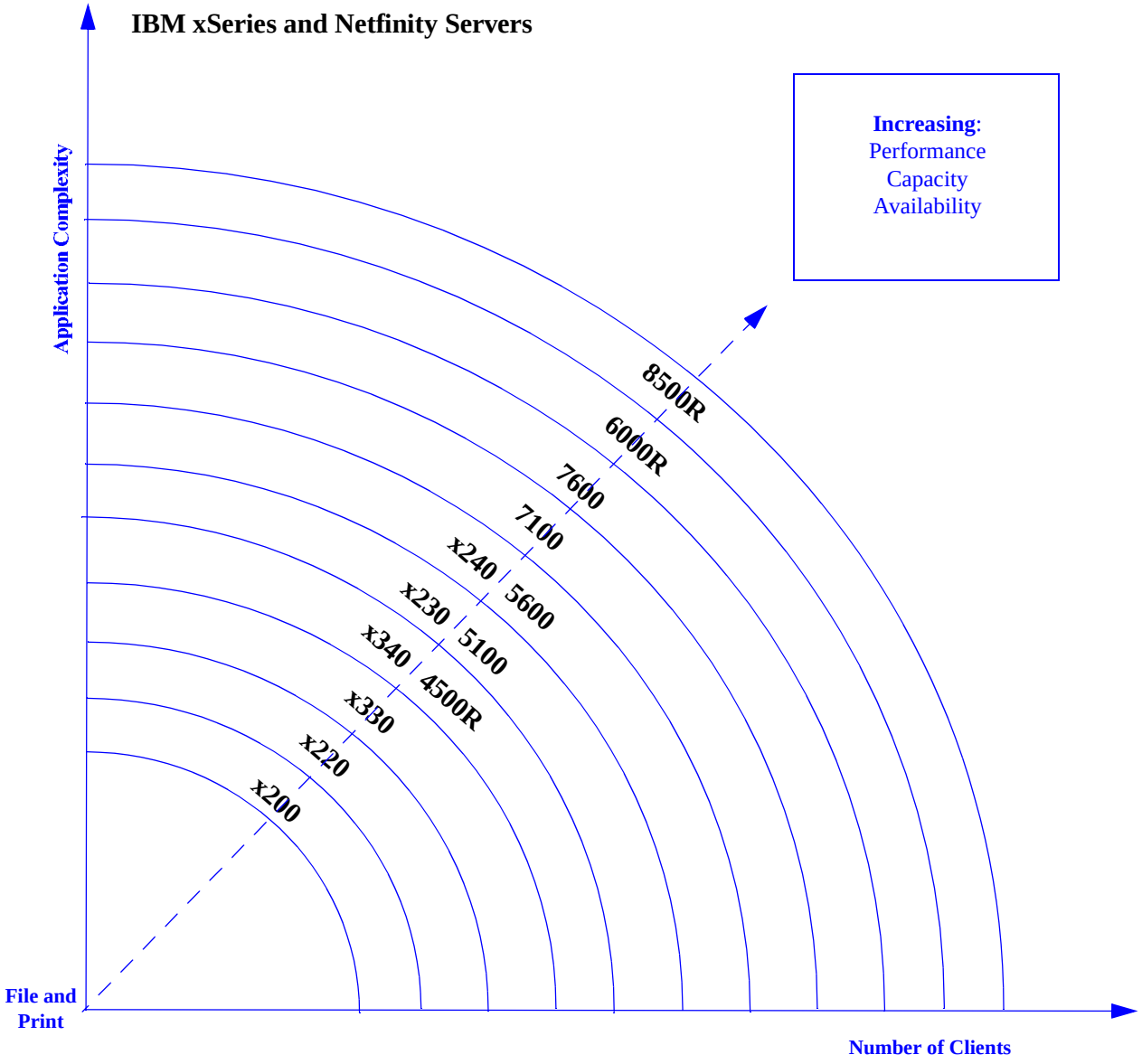
IBM Internal: IBM EMEA xSeries / Netfinity Intranet site: w3.ibm.com/psg/emea/xseries - OrderBUILDER Application and Updates, Spreadsheet Configurator, Configuration and Options Guide, Rack Configurator, Tape Sizer.

The OrderBUILDER application is available on CD - to receive your copy, send an e-mail to the address below with your name, company and full address details (not PO Box numbers).

For further information contact:-

e-mail: psg_configure@uk.ibm.com
Notes Mail: EMEA PSG-Configuration-Support/UK/IBM@IBMGB

Server Product Positioning



When in a competitive situation, this table suggests the appropriate IBM Netfinity 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

	Value	Price Performance	Mission Critical	Rack Optimized
8-way			**IBM**: **Netfinity 8500R** Compaq: ProLiant 8000 Dell: No Offering HP: NetServer LH 6000, LT6000R	**IBM**: **Netfinity 8500R** Compaq:ProLiant 8500 Dell: PowerEdge 8450 HP: NetServer LXr 8000
4-way		**IBM**: **Netfinity 7100** Compaq: ProLiant ML570 Dell: PowerEdge 6400 HP: NetServer LH4	**IBM**: **Netfinity 7600** Compaq: No Offering Dell: No Offering HP: NetServer LXr 8000	**IBM: Netfinity 6000R** Compaq: ProLiant DL580 Dell: PowerEdge 6450 HP: NetServer LH4r
2-way	**IBM**: **xSeries 220** Compaq: ProLiant ML350 Dell: PowerEdge 1300 HP: NetServer E60	**IBM**: **xSeries 230 / Netfinity 5100** Compaq: ProLiant ML370 Dell: PowerEdge 2400 HP: NetServer LC2000	**IBM**: **xSeries 240 / Netfinity 5600** Compaq: ProLiant ML530 Dell: PowerEdge 4400 HP: NetServer LH 3000	**IBM**: **xSeries 330, xSeries 340/ Netfinity 4500R** Compaq: ProLiant DL380, DL360 Dell: PowerEdge 2450 HP: NetServer LPr
Uni	**IBM**: **xSeries 200** Compaq: ML330 Dell: No Offering HP: No Offering			

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This chart 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 only, since each customer environment is unique and is unlikely to be precisely represented by any of the specific applications in the chart. However by using the chart, it is expected that a reasonable approximation can be reached. External Storage Units are utilised when internal capacities are exceeded. Basic guidelines on the use of the chart are given at the bottom of the next page. These are not published benchmark results. **Access: http://www.ibm.com/pc/us/techlink/srvperf.html to obtain benchmark data**.

Application/Expectation of Maximum # of Users		xSeries 200 Uni-Pentium® III 866MHz[1]/ 256KB	xSeries 220 Dual Pentium III 933MHz/ 256KB	xSeries 330 Dual Pentium III 1GHz/ 256KB	xSeries 340 / Netfinity 4500R Dual Pentium III 1GHz/ 256KB
DB Transaction Processing Select, Update and Delete; Does not include image or Decision Support	# of Users	1500	1970	2110	2530
	# of processors	1	2	2	2
	Memory	2GB	768MB	2GB	4GB
	# Hard Disk Drives	12 to 18	40 to 50	36 to 48	30 to 50
	# RAID Adapters	≥1	≥2	≥2	≥2
	#Network Connections	1	1	1	1 to 2
File and Print Application is stored locally. (For server stored applications - cut number of users in half).	# of Users	1200	1000	2100	2100
	# of Processors	1	2	2	2
	Memory	2GB	768MB	2GB	2GB
	# Hard Disk Drives	5 to 10	4 to 8	20 to 30	20 to 30
	# RAID Adapters	≥ 1	1	1 to 2	1 to 2
	# 100Mbps Ethernet Connections	≥2	2	4	4
Lotus Notes® 10% Power Users 40% Mail 50% Mail & DB	# of Users	900	1180	1950	2200
	# of Processors	1	2	2	2
	Memory	2GB	768MB	2GB	2 to 3GB
	# Hard Disk Drives	5 to 10	10 to 15	20 to 30	20 to 30
	# RAID Adapters	≥ 1	1	1 to 2	1 to 2
	# Network Connections	≥ 1	≥2	≥2	≥2
Microsoft® Exchange Server 5.5 100% Med Users 30 MB Mailbox	# of Users	1980	2200	2310	2310
	# of Processors	2	2	2	2
	Memory	1GB	1GB	2GB	2GB
	# Hard Disk Drives	9	10	10	9
	# RAID Adapters	1	≥ 1	1	1
	# Network Connections	≥1	≥1	≥2	≥1
SAP 3-Tier Distributed Ver 4.0b Processing Sales and Distribution Application (Minimum of 16-20 Servers) See Note 2.	# of Users	-	-	-	-
	# of Processors	-	-	-	-
	Memory (MB)	-	-	-	-
	# Hard Disk Drives	N/A	N/A	N/A	N/A
	# RAID Adapters	-	-	-	-
	# Network Connections	-	-	-	-
SAP Central Ver 4.0b Processing Sales and Distribution Application (One Server) See Note 2.	# Users	75	80	160	160
	# Processors	1	1	2	2
	Memory	1GB	1GB	1GB	1GB
	# Hard Disk Drives	12	12	12 to 24	12 to 24
	# RAID Adapters	≥1	≥1	≥1	≥1
	# Network Connections	1	1	1	1
High Availability Features	Hot-Swap HDD Bays	-	-	-	X
	Hot-Plug PCI Slots	-	-	-	-
	Hot-Swap Power	-	-	-	X
	Hot-Swap Fans	-	-	-	X
	RAID	Opt.	Opt.	Opt.	Opt.
	Clustering Support	-	-	-	X
	Sys. Mgt. Processor	-	Opt.	-	X
Other Distinguishing Features	Max # Processors	2	1	2	2
	Max Memory	2GB	768MB	2GB	4GB
	Max Int. Storage (GB)[3]	145.6	145.6	72.8	218.4
	Max Int. Storage (GB) with Int. Tape drive	145.6	109.2	N/A	109.2
	Available PCI Slots	5	5	2	5
	19" Rack Models	-	-	-	X
	NetBAY3x Support	-	-	-	-

Application/Expectation of Maximum # of Users		xSeries 230 Netfinity 5100 Dual Pentium III 1GHz/ 256KB	xSeries 240 Netfinity 5600 Dual Pentium III 1GHz/ 256KB	Netfinity 6000R Quad Pentium III Xeon™ 700MHz/ 2048KB	Netfinity7100 Quad Pentium III Xeon 700MHz/ 2048KB	Netfinity7600 Quad Pentium III Xeon 700MHz/ 2048KB	Netfinity 8500R Eight-Way Pentium III Xeon 700MHz/ 2048KB
DB Transaction Processing Select, Update and Delete; Does not include image or Decision Support	# of Users	2530	2530	6420	6420	6420	10,315
	# of processors	2	2	4	4	4	8
	Memory	4GB	4GB	4GB	4GB	4GB	4GB
	# Hard Disk Drives	30 to 50	30 to 50	80 to 140	80 to 140	80 to 140	180 to 250
	# RAID Adapters	≥2	≥2	≥4	≥4	≥4	≥5 or Fibre
	#Network Connections	1 to 2	1 to 2	2 to 3	2 to 3	2 to 3	2 to 3
File and Print Application is stored locally. (For server stored applications - cut number of users in half).	# of Users	2100	2100	5000	5000	5000	6000
	# of Processors	2	2	2	2	2	3 to 4
	Memory	2GB	2GB	2 to 4GB	2 to 4GB	2 to 4GB	4GB
	# Hard Disk Drives	20 to 30	20 to 30	50 to 90	50 to 90	50 to 90	75 to 150
	# RAID Adapters	1 to 2	1 to 2	4	≥4	≥4	≥4 or Fibre
	# 100Mbps Ethernet Conn.	4	4	8	8	8	10
Lotus Notes 10% Power Users 40% Mail 50% Mail & DB	# of Users	2200	2200	4215	4215	4215	6695
	# of Processors	2	2	4	4	4	8
	Memory	2 to 3GB	2 to 3GB	3GB	3GB	3GB	4GB
	# Hard Disk Drives	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	30 to 40
	# RAID Adapters	1 to 2	1 to 2	2 to 3	2 to 3	2 to 3	≥3
	# Network Connections	≥2	≥2	≥3	≥3	≥3	≥4
Microsoft Echange Server 5.5 100% Med Users 30 MB Mailbox	# of Users	2310	2310	6400	6600	7000	8000
	# of Processors	2	2	4	4	4	8
	Memory	2GB	2GB	3GB	≥3GB	4GB	4GB
	# Hard Disk Drives	12	12	30	30 to 40	40 to 50	40 to 50
	# RAID Adapters	1	2	2	≥2	≥3	≥3
	# Network Connections	≥1	≥1	≥2	≥2	≥2	≥2
SAP 3-Tier Distributed Ver 4.0b Processing Sales and Distribution Application (Minimum of 16-20 Servers) See Note 2.	# of Users	2790	2800	4300	3150	3350	5100
	# of Processors	2	2	4	4	4	8
	Memory	1 to 2GB	1 to 2GB	≥4GB	≥4GB	≥4GB	≥4GB
	# Hard Disk Drives	24 to 36	24 to 36	48 to 60	48 to 60	48 to 60	48 to 60
	# RAID Adapters	≥2	≥2	≥3	≥3	≥3	≥3
	# Network Connections	1	1	1	1	1	1
SAP Central Ver 4.0b Processing Sales and Distribution Application (One Server) See Note 2.	# Users	162	180	312	245	245	375
	# Processors	2	2	4	4	4	8
	Memory	1 to 2GB	1 to 2GB	≥2GB	≥2GB	≥2GB	≥4GB
	# Hard Disk Drives	12 to 24	12 to 24	24 to 36	24 to 36	24 to 36	24 to 36
	# RAID Adapters	≥1	≥1	≥2	≥2	≥2	≥2
	# Network Connections	1	1	1	1	1	1
High Availability Features	Hot-Swap HDD Bays	X	X	X	X	X	X
	Hot-Plug PCI Slots	-	X	X	Opt.	X	X
	Hot-Swap Power	Opt.	X	X	X	X	X
	Hot-Swap Fans	-	X	X	X	X	X
	RAID	Opt.	Opt.	Opt.	Opt.	X	Opt.
	Clustering Support	X	X	X	X	X	X
	Sys. Mgt. Processor	X	X	X	X	X	X
Other Distinquishing Features	Max # Processors	2	2	4	4	4	8
	Max Memory	4GB	4GB	16GB	16GB	16GB	32GB
	Max Int. Storage (GB)	218.4	218.4	218.4	364	364	72.8
	Max Int. Storage (GB) with Int. Tape drive	218.4	218.4	N/A	364	364	N/A
	Available PCI Slots	5	5	6	6	5	12
	19" Rack Models	X	X	X	X	X	X
	NetBAY3x Support	-	-	-	X	X	X[4]

1. MHz measures microprocessor internal clock speed, not application performance. Many factors affect application performance.
2. This information for SAP is a guide only. Refer to the IBM SAP R/3 Advanced Sizing and Planning Questionnaires at: www.ibm.com/pc/europe/configurators , or to your IBM representative, for more information.
3. When referring to hard disk drive capacity, GB equals one billion bytes. Total user accessible capacity may vary depending on operating environments.
4. 8500R - with a Rack-to-Tower kit installed.

Procedure for Server Selection Guidance Chart

File and Print numbers are Novell Netware-based with all others based on Microsoft Windows NT®. Other Networking Operating System (NOS) results could vary. Extensive SAP sizings are available from IBM/SAP Competency Centres. 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.

Appliance Servers, Internet Cache Solutions, Best Buy Models and Business Model Summary

Product Family	Withdrawal Date: ddmmyy[15]	Part Number	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory: (Std/Max)(R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Ethernet (Mbps)(OB=Onboard)	Additional SCSI Controller (Part Number)	Internal Hard Disk Drive Std (Quan/P/N)	Bays (Total/Avail)	Slots (Total/Avail)	Std. Model P/N[3]
APPLIANCE SERVERS[1]														
xSeries 130	-	K41YXxx	800[5]	1/2	256	256MB[R]/1GB[7]	Rack(1U)	1/1	2 x 10/100[OB]	-	1 x 37L7204	4/1	2/1[16]	NOTE: 17
xSeries 135	-	K41XXxx	800[5]	1/2	256	256MB[R]/1GB[7]	Rack(1U)	1/1	2 x 10/100[OB]	-	1 x 37L7204	4/1	2/0[16]	NOTE: 18
xSeries 150	-	K833Yxx	800[5]	1/2	256	256MB[R]/2GB[7]	Tower	2/3	2 x 10/100[19]	37L6091	3 x 37L7206[21]	10/5	5/3	NOTE: 22
xSeries 150	-	K83XYxx	800[5]	2/2[4]	256	1GB[R]/2GB[7]	Rack(5U)	2/3	4 x 10/100[20]	37L6889	6 x 37L7206[21]	10/2	5/1	NOTE: 23
INTERNET CACHE SOLUTIONS[2]														
xSeries 220	-	K533Xxx	866[5]	1/2	256	128MB[R]/4GB[7]	Tower	1/1	2 x 10/100[26]	-	1 x 00N8207	7/4	5/4	NOTE: 32
xSeries 330	-	K434Yxx	866[5]	1/2	256	512MB[R]/4GB[7,11]	Rack(1U)	1/1	2 x 10/100[OB]	-	2 x 37L7205	4/0	2/2	NOTE 32
xSeries 330	-	K435Yxx	866[5]	1/2	256	1GB[R]/4GB[7,27]	Rack(1U)	1/1	2 x 10/100[OB]	-	1 x 37L7205	4/1	2/2	NOTE 32
xSeries 340	-	K645Yxx	866[5]	1/2	256	1GB[R]/4GB[7,28]	Rack(3U)	1/2	2 x 10/100[26]	-	3 x 37L7205	8[13]/3	5/4	NOTE 32
xSeries 340	-	K646Yxx	866[5]	1/2	256	2GB[R]/4GB[7,29]	Rack(3U)	1/2	10/100[OB]	-	6 x 37L7205	8[31]/0	5/5	NOTE 32
xSeries 340	-	K647Yxx	866[5]	1/2	256	3GB[R]/4GB[7,30]	Rack(3U)	1/2	10/100[OB]	-	3 x 37L7205	8[13]/3	5/5	NOTE 32
BEST BUY MODELS[3]														
xSeries 200	-	K812Gxx[25]	667[24]	1/1	128	128MB/1.5GB	Tower	1/1	10/100[OB]	-	1 x 19K4460	7/3[25]	5/5	K812Xxx
xSeries 200	-	K842Gxx	800[5]	1/1	256	128MB/1.5GB	Tower	1/1	10/100[OB]	-	1 x 00N8205	7/4	5/4	K842Xxx
BUSINESS MODELS[3]														
xSeries 230	-	K862Gxx	1GHz[5]	1/2	256	256MB[R]/4GB[7,10]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	K861Yxx
xSeries 240	-	K481Gxx	1GHz[5]	1/2	256	512MB[R]/4GB[7,8]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	K481Yxx
xSeries 330	15/04/01	K432Gxx	866[5]	2/2[4]	256	512MB[R]/4GB[7,11]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K431Yxx
xSeries 330	-	K442Gxx	933[5]	1/2	256	512MB[R]/4GB[7,11]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K441Yxx
xSeries 330	-	K452Gxx	1GHz[5]	1/2	256	512MB[R]/4GB[7,11]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K451Yxx
xSeries 340	-	K66SGxx	1GHz[5]	1/2	256	256MB[R]/4GB[7,10]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[13]/3	5/4	K66RYxx
4500R	30/03/01	634G9xx	800[5]	1/2	256	256MB[R]/4GB[7,10]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[13]/3	5/4	63RYTxx
4500R	-	644G9xx	866[5]	1/2	256	256MB[R]/4GB[7,10]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[13]/3	5/4	64RYTxx
4500R	-	654G9xx	933[5]	1/2	256	256MB[R]/4GB[7,10]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[13]/3	5/4	65RYTxx
5100	30/03/01	834G9xx	800[5]	1/2	256	256MB[R]/4GB[7,10]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	831YExx
5100	-	844G9xx	866[5]	1/2	256	256MB[R]/4GB[7,10]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	841YExx
5100	-	854G9xx	933[5]	1/2	256	256MB[R]/4GB[7,10]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	851YExx
5600	-	464G9xx	866[5]	1/2	256	512MB[R]/4GB[7,8]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	461YExx
5600	-	474G9xx	933[5]	1/2	256	512MB[R]/4GB[7,8]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	471YExx
6000R	-	23GG9xx	700[6]	2/4[4]	1024	512MB[R/]16GB[12]	Rack(4U)	1/3	10/100[OB]	37L6091	3 x 37L7205	8[14]/3	6/5	21RYMxx
7100	-	67TG9xx	700[6]	2/4[4]	1024	512MB/16GB[9]	Tower	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	631YMxx
7100	-	67GG9xx	700[6]	2/4[4]	1024	512MB/16GB[9]	Rack(8U)	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	63RYMxx

1. Appliance Servers are pre-configured and tested with a pre-loaded, tuned, software stack to allow simple ‘out-of-the-box’ installation and instant enhancement of Web server capabilities. A limited options set is supported to allow expansion.
2. These new models are designed for caching Internet content. They are pre-loaded with cache applicance software and have been optimised for performance with pre-configured memory, storage and LAN controllers. See also Note 32.
3. Business Models are standard models shipped with additional options already installed. They provide popular starting configurations that give a price advantage and enable easy installation. Best Buy models are identified as specially-priced offer models. The Part Number that appears in the extreme righthand column shows the standard model upon which the Business or Best Buy model is based. Refer to the appropriate product section and to this reference part number for more information.
4.One additional processor (of the same type and speed as the standard one) is supplied already installed with this Business Model.
5. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133MHz Front-side bus (FSB).
6. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache.
7. High-speed 133MHz SDRAM.
8. One additional 256MB memory option P/N 33L3060 is supplied already installed with this Business Model.
9. The standard memory is replaced in these models with four 128MB memory options P/N 33L3113 - already installed.
10. The standard memory is replaced in this model with one 256MB RDIMM P/N 33L3125 - already installed
11. One additional 256MB memory option P/N 33L3144 is supplied already installed with this Model.
12. Advanced Chipkill ECC memory - corrects two, three or four-bit errors.
13. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) which converts the two available removable media bays into three slim-line (SL) hot-swap bays.
14. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) which enables hot-swap bays 4 to 6.
15. Not available from IBM after this date: Business Partner inventory may be available.
16. The xSeries 130 Appliance Server supports the addition of 1 x P/N 3430301 Gigabit Ethernet Adapter only. The xSeries 135 Appliance Server does not support the addition of any adapters. Additional options support is limited for both of these servers.
17. The xSeries 130 Web Hosting Appliance Server is pre-loaded with a tuned Windows Powered operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Windows Powered OS, Microsoft Internet Information Services 5.0, Netfinity Web Server Accelerator V2.0, Advanced appliance configuration utility, Netfinity Director 2.12 UM Server Extensions (agent version).
18. The xSeries 135 Web Hosting Appliance Server is pre-loaded with a tuned Turbo Linux operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Turbo Linux OS, IBM HTTP Server, Appliance System Management, Advanced appliance configuration utility. The xSeries 135 Appliance Server pre-loaded software stack does not support the onboard Advanced System Management Processor
19. The xSeries 150 Network Attached Storage Appliance Server P/N K833Yxx (Tower model) includes one 10/100 onboard Ethernet controller and one additional 10/100 Ethernet adapter. Additional options support is limited for this server.
20. The xSeries 150 Network Attached Storage Appliance Server P/N K83XYxx (Rack model) includes one 10/100 onboard Ethernet controller and three additional 10/100 Ethernet adapters. Additional options support is limited for this server.
21. Only the Rack model P/N K83XYxx supports external storage via the attachment of an EXP300 enclosure.
22. The xSeries 150 Network Attached Storage Appliance Server P/N K833Yxx is pre-loaded with a tuned Windows Powered operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Windows Powered OS, Netfinity Director 2.12 UM Server Extensions (agent version), ServeRAID Manager RAID configuration and monitoring utilities, Advanced appliance configuration utility, Columbia Data Products Open Transaction Manager. This model is designed and configured to be a Workgroup Model. It includes a ServeRAID 4L adapter and 3 x 36.4GB Ultra160 hot-swap disks.
23. The xSeries 150 Network Attached Storage Appliance Server P/N K83XYxx is pre-loaded with a tuned Windows Powered operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Windows Powered OS, Netfinity Director 2.12 UM Server Extensions (agent version), ServeRAID Manager RAID configuration and monitoring utilities, Advanced appliance configuration utility, Columbia Data Products Open Transaction Manager. This model is designed and configured to be a Departmental Model. It includes a ServeRAID 4H adapter and 6 x 36.4GB Ultra160 hot-swap disks
24. Intel Celeron Processor.
25. This model is configured with an IBM 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
26. This model includes one 10/100 onboard Ethernet controller and one additional 10/100 Ethernet adapter P/N 34L1501.
27. Three additional 256MB memory options P/N 33L3144 are supplied already installed with this Model.
28. The standard memory is replaced in this model with four 256MB RDIMMs P/N 33L3125 - already installed.
29. The standard memory is replaced in this model with four 512MB RDIMMs P/N 33L3127 - already installed.
30. The standard memory is replaced in this model with three 1GB RDIMMs P/N 33L3129 - already installed.
31. Includes optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) as standard - this kit converts the two available removable media bays into three slim-line (SL) hot-swap bays.
32. xSeries 220 P/N K533Xxx is a Micro Tier Internet Cache Solution (ICS). xSeries 330 P/N K434Yxx is a Low Tier ICS and P/N K435Yxx is a Low Tier Reverse Proxy Solution. xSeries 340 P/N K645Yxx is a Mid Tier ICS, P/N K646Yxx is a Carrier Tier ICS and P/N K647Yxx is a Carrier Tier Reverse Proxy Solution. See also Note 2.

IBM xSeries 200

xSeries 200 At-A-Glance Chart

K811Xxx	-	667[1]	1/1	128	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/2	15/90GB[2,3]	48X-20X	7/4	5/5
K812Xxx[4]	-	667[1]	1/1	128	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/1	15/90GB[2,3]	48X-20X	7/3[4]	5/5
K813Xxx	-	667[1]	1/1	128	128MB/1.5GB	Tower	1/1	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4
K841Xxx	-	800[5]	1/1	256	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/2	15/90GB[2,3]	48X-20X	7/4	5/5
K842Xxx	-	800[5]	1/1	256	128MB/1.5GB	Tower	1/1	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4
K851Xxx	-	866[5]	1/1	256	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/2	15/90GB[2,3]	48X-20X	7/4	5/5
K852Xxx	-	866[5]	1/1	256	128MB/1.5GB	Tower	1/1	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4

1. Intel® Celeron™ processor.
2. Maximum capacity assumes replacement of standard hard disk drives and tape drive (if installed), with the largest supported IBM hard disk drive.
3. Maximum capacity may be increased, by converting IDE models to support SCSI devices and replacing IDE devices with the largest supported hard disk drives. See Storage Configurator section.
4. This model is configured with an IBM 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
5. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 MHz front-side bus (FSB).

xSeries 200 Processor Upgrades

Part Number	Processor Upgrades Description	Processor Speed Upgrade[1]
21P9539	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K81xXxx
10K3818	866 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K81xXxx to K84xXxx

1.Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type “Type-Model” in Quick Path. Select “Downloadable files” and then “BIOS”.

xSeries 200 Memory Configurator

DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
33L3079	64MB 133MHz ECC SDRAM DIMM Memory
33L3081	128MB 133MHz ECC SDRAM DIMM Memory
33L3083	256MB 133MHz ECC SDRAM DIMM Memory
33L3085	512MB 133MHz ECC SDRAM Unbuffered DIMM Memory

Total System Memory[1]		DIMMs			
Standard Model with 64MB	Standard Model with 128MB	64 MB P/N 33L3079	128 MB P/N 33L3081	256 MB P/N 33L3083	512 MB P/N 33L3085
128 MB	192 MB	1	-	-	-
192 MB	256 MB	2 or	1	-	-
320 MB	384 MB	-	2 or	1	-
384 MB	-	-	3[2]	-	-
576 MB	640 MB	-	-	2 or	1
768 MB	768 MB	-	-	3[2]	-
1088 MB	1152 MB	-	-	-	2
1536 MB (max)[2]	1536 MB (max)[2]	-	-	-	3[2]

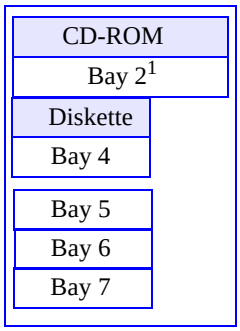
This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller DIMMs may provide a more cost-effective alternative to using larger DIMMs. Select the desired total memory from the appropriate column (Standard Model 64MB or 128MB), then select a quantity in that row from one of the DIMM columns.

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

xSeries 200 Internal Hard Disk Drive (HDD) and External Storage Configurator

Total Internal Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDD
	9.1 GB (P/N 00N8204)	18.2 GB (P/N 00N8205)	36.4 GB (P/N 00N8206)	9.1 GB (P/N 00N8207)	18.2 GB (P/N 00N8208)	36.4 GB (P/N 00N8209)	18.2 GB (P/N 19K0658)
9.1GB	9.1GB Standard on Base SCSI Models (7200 rpm)	-	-	9.1GB Standard on Base SCSI Models (7200 rpm)	-	-	-
18.2GB	1	-	-	1	-	-	-
27.3GB	2 or	1	-	2 or	1 or	-	1
36.4GB	3	-	-	3	-	-	-
45.5GB	-	2 or	1	-	2 or	1 or	2
54.6GB	1 and	2	-	1 and	2	-	-
or 54.6GB	-	-	-	1 and	-	-	2
81.9GB	-	-	2	-	-	2	-
91GB	1 and	-	2	1 and	-	2	-
100.1GB	-	1 and	2	-	1 and	2	-
or 100.1GB	-	-	-	-	-	2 and	1
145.6GB (max)[2]	-	-	4[2]	-	-	4[2]	-

This table does not represent all possible hard disk drive (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 ± 0.2 GB unless otherwise noted.
2. Maximum capacity assumes replacement of standard hard disk drives and tape drive (if installed) with the largest supported IBM hard disk drive.



Total Internal Storage[1]	7200 RPM IDE HDDs[2]		
	15 GB (P/N 19K4460)	20.4 GB (P/N 19K4461)	30 GB (P/N 00N8203)
15GB	15GB Standard on Base EIDE Models	-	-
30GB	1	-	-
45GB	2[3] or	-	1
55.8GB	-	2[3]	-
75GB	-	-	2[3]
90GB (max)[4]	-	-	3[4]

This table does not represent all possible hard drive configurations.

1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ±0.2 GB unless otherwise noted.
2. The xSeries 200 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drive, hard disks and IDE tape drive.
3. Not a supported configuration on model P/N K812Xxx which includes an IBM 10/20 GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
4. Maximum capacity assumes replacement of standard hard disk drives and tape drive (if installed) with the largest supported IBM hard disk drive.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")	HH	yes	open[1, 2]
3	89 mm (3.5")	SL	yes	Diskette
4	89mm (3.5")	SL	yes	open
5...7	89mm (3.5")	SL	yes	open

1. Bay 2 supports removable media devices only. Hard disk drives are not supported.
2. 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 is standard in model P/N K812Xxx.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty
IDE HDDs[1, 2]					
19K4460	15GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4...7	3[3]
19K4461	20.4GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4...7	3[3]
00N8203	30GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4...7	3[3]
Non Hot-Swap Ultra160 SCSI HDDs[2]					
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4...7	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4...7	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4...7	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4...7	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4...7	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4...7	4
19K0658	18.2GB 15,000 rpm Ultra160 SCSI HDD	15,000	SL	4...7	4
External Storage Expansion Unit[4]		**Form Factor**			
19K11xx[7]	EXP300 Storage Expansion Unit[5,6]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[6]	-			

1.The xSeries 200 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, hard disks and IDE tape drives.
2. Mixing of IDE and SCSI hard disk drives is not supported.
3. Limited to 2 drives in model P/N K812Xxx due to installed tape drive option.
4. Not supported by the external SCSI port included in SCSI models. 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.
5. The EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
6. 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 Rack Power Cables (one for each power supply).
7.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.

xSeries 200 Internal SCSI Cabling

EIDE Models
In xSeries 200 models using the EIDE interface for storage device attachment, a two-drop cable is used to attach the standard 15 GB EIDE HDD to one of the EIDE connectors. A second EIDE controller provides the interface for the IDE CD-ROM drive. A two-drop cable connects the IDE controller to the IDE CD-ROM. Up to two additional EIDE or IDE devices can be installed (one off of each controller).

SCSI Models
xSeries 200 models with a SCSI adapter are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in multi-mode active terminator at one end of the cable. The other end of the cable is attached to the internal 68-pin connector of the standard Ultra160 SCSI adapter. SCSI devices can be connected to any of the five cable connectors. If 8-bit (narrow) devices are to be installed, a 68- to 50-pin converter P/N 32G3925 is required for each narrow device.

Other Configuration Alternatives
In the case where a RAID controller is used to support internal drives in a xSeries 200, the standard cable is moved from the onboard controller to the RAID adapter. To connect a tape drive to the onboard or other supported SCSI controller, use the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).

External SCSI support can be obtained by installing an optional SCSI adapter or RAID controller and using appropriate external SCSI cabling.

xSeries 200 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]
	SCSI Storage Controllers[2, 3]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	2...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	2...5
19K4646	PCI Wide Ultra160 SCSI Adapter[6]	Half	32-bit	2...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	2...5
	Networking[7]			
	Ethernet			
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...5
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...5
	Token Ring[8]			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[8]	Half	32-bit	1...5
34L5001	16/4 Token-Ring PCI Management Adapter[8]	Half	32-bit	1...5
34L5201	High-speed 100/16/4 Token-Ring PCI Management Adapter[8]	Half	32-bit	1...5
	Communications[9]			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[10]	Half	32-bit	2...5[10]

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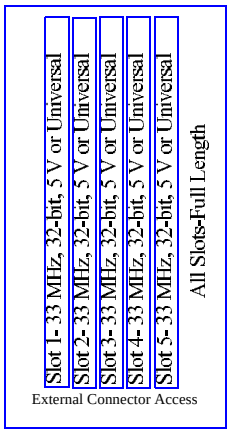


1. The xSeries 200 has five full-length, 33 MHz PCI expansion slots. The number of available slots is model specific.
2. Some models of the xSeries 200 include a single channel Ultra160 SCSI Adapter with a five drop multi-mode terminated LVD SCSI Cable. All other models include dual-channel EIDE controllers and require an optional SCSI adapter for SCSI functionality. See the At-A-Glance chart for model attributes
3. Storage controllers are supported in slots two through five only. Slots two and four, and slots three and five, are 'paired' in adapter support terms and can only support the same type of adapter. i.e slots two and four can both only contain storage controllers or they can both only contain network adapters. Similarly with slots three and five
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
6. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
7. xSeries 200 includes an integrated full-duplex, 10.100 Mbps Ethernet controller. Networking adapters are supported in slots one through five. Slots two and four, and slots three and five, are 'paired' in adapter support terms and can only support the same type of adapter. i.e slots two and four can both only contain network adapters or they can both only contain storage controllers. Similarly with slots three and five.
8. Wake on LAN™ is supported for networking adapters designed with this function when installed in slots one through five. Slots two and four, and slots three and five, are 'paired' in adapter support terms and can only support the same type of adapter. i.e slots two and four can both only contain network adapters or they can both only contain storage controllers. Similarly with slots three and five.
9. xSeries 200 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A software compatible) and one high-speed parallel port supporting devices using SSP/EPP/ECP protocols adhering to the IEEE 1284 Standard.
10. See Appendix E for details of Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.

xSeries 200 Power, Monitors, Accessories

Part Number	Description
	Power[1,10]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Free Standing Uninterruptible Power Supply (UPS)[2]
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
14RIxxx[9]	APC Smart-UPS 1400RMB[3,10]
30RIxxx[9]	APC Smart-UPS 3000RMB[3,10]
37L6862	APC Smart-UPS 5000RMB[4,10]
	Monitors[5]
T3347xx[8]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T31U2xx[8]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32U3xx[8]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[8]	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
11AG1xx[8]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]

1. The xSeries 200 includes a 330 W voltage sensing power supply and a single standard country power cord.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 200 contains a S-3 Savage-4 LT video adapter with 8Mb of video memory plugged into the standard AGP slot.
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. 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.
8. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
9. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.
10. The xSeries 200 ships with a standard country power cord. If conversion to Rack format is being carried out, Rack Power Cable P/N 94G7448 (type C12), must be ordered to allow connection to a high voltage UPS or PDU.

Part Number	Description
	Conversion Kits
09N4300	4Ux20D Tower-to-Rack Kit[6]
	Rack and NetBAY[1,6]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (Perforated Doors)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	NetBAY22 Rack Extension Kit
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[6]
	Keyboard and Mouse[2]
28L36xx[5]	Space Saver II Keyboard[3, 4]

1 Rack installation of an xSeries 200 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. The xSeries 200 includes both a mouse and non-space saver keyboard.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
6. The xSeries 200 ships with a standard country power cord. If conversion to Rack format and connection to a high voltage UPS or PDU is being carried out, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 200 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Included.	Ext. Tape Enclosures[1]
20L0549	10/20GB TR5 Internal IDE Tape Drive[2]	2, 4	-	89 mm (3.5") SL or 133 mm (5.25") HH	-	-	-
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[3,4,5]	2	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	10L7440, 03K8756
09N4042	10/20GB NS Internal SCSI Tape Drive[3,4,5]	2, 4	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	10L7440, 03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[4,5]	2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	10L7440[6], 03K8756[7]
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[8]	-	8/16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[9]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[10]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	10L7440
10K2340	Media Bay Tray and LVD Cable Kit[4,7]	-	16 LVD	Internal	Y	N	03K8756

Note: SCSI models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. SCSI tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable and an external 0.8-mm VHDCI connector.

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.
2. SCSI models include a two-drop EIDE cable for attachment to the CD-ROM and an optional IDE tape drive. EIDE Model P/N K812Xxx includes 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
3.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable.
4. For RAID configurations (in SCSI models) where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit P/N 10K2340 is required, to allow attachment of a SCSI Tape Drive to the standard Ultra160 SCSI Adapter.
5. EIDE models require optional PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable, to allow attachment of a SCSI Tape Drive.
6. Requires 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
7. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode LVD-SCSI terminated LVD cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
8. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
9. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
10. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in an Expansion Unit P/N 03K8756 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

xSeries 200 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.

Internet Server

Part Number	Description	Quantity
K812Xxx	x200 667MHz/128KB, 64MB, EIDE, 15GB, Tape, 48X	1
33L3081	128 MB 133Mhz ECC SDRAM DIMM Memory	1[1]
19K4461	20.4 GB 7200 rpm ATA/100 (EIDE) HDD	1[2]
T31U2xx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 192 MB of system memory.
2. For a total of 35.4 GB of internal storage.

An Internet server handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients as a file server does.

With this is mind, the the xSeries 200 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 192 MB of system memory (expandable to 1.5 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
K852Xxx	x200 866MHz/256KB, 128MB, Ultra160, 1 x 9.1GB, 48X	1
33L3081	128 MB 133 MHz ECC SDRAM DIMM Memory	1[1]
00N8204	9.1 GB Ultra160 SCSI HDD	1[2]
00N8205	18.2 GB Ultra160 SCSI HDD	2[2]
00N7991	20/40GB DDS/4 4-mm Internal Tape Drive	1
T31U2xx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 200 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
K852Xxx	x200 866MHz/256KB, 128MB, Ultra160, 1 x 9.1GB, 48X	1
33L3083	256 MB 133 MHz ECC SDRAM DIMM Memory	1[1]
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
00N8204	9.1 GB Ultra160 SCSI HDD	2[2]
10K2340	Media Bay Tray and LVD Cable Kit	1[3]
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
T31U2xx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. Three HDDs are used (in total), for RAID 5 protection. Effective storage capacity is two HDDs (18.2GB).
3. Provides a cable for dedicated attachment of tape to standard controller.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 200 was selected to provide an affordable price point for an application server, with Pentium III processing, 384 MB of system memory (expandable to 1.5 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 220

Part Number	Withdrawal Date: ddmmyy	Processor Speed (MHz)[1]	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap Hard Disk Capability (H)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)[2]	Bays: (Tot/Av)	Slots (Tot/Av)
xSeries 220 At-A-Glance Chart																
K521Xxx	-	800	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K522Xxx	-	800	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
K52AXxx	-	800	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K531Xxx	-	866	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K532Xxx	-	866	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
K53AXxx	-	866	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K541Xxx	-	933	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K542Xxx	-	933	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
K54AXxx	-	933	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5

1. Intel Pentium III processor with advanced transfer (full speed) L2 cache.
2. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

xSeries 220 Processor Upgrades

Part Number	Processor Upgrades Description	SMP Support[1]	Processor Speed Upgrade[2]
21P9539	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K52xXxx	-
10K3818	Netfinity 866 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	All K53xXxx	All K52xXxx
10K3819	Netfinity 933 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	All K54xXxx	All K52xXxx to K53xXxx

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 one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type “Type-Model” in Quick Path. Select “Downloadable files” and then “BIOS”.

xSeries 220 Memory Configurator

DIMM Socket
DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
33L3142	128MB 133MHz SDRAM ECC RDIMM Memory
33L3144	256MB 133MHz SDRAM ECC RDIMM Memory
33L3146	512MB 133MHz SDRAM ECC RDIMM Memory
33L3152	1 GB 133MHz SDRAM ECC RDIMM

Total System Memory[1]	Quantity of RDIMMs Added			
Standard Model with 128 MB (1 x 128)	128 MB (33L3142)	256 MB (33L3144)	512 MB (33L3146)	1 GB (33L3152)
256MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176 MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)[2]	-	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller DIMMs may provide a more cost-effective alternative to using larger DIMMs. Select the desired total memory from the lefthand column (standard memory is 128MB), then select a quantity in that row from one of the DIMM columns.

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.

xSeries 220 Internal Hard Disk Drive (HDD) and External Storage Configurator

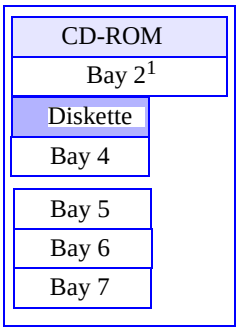
Total Internal Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 00N8204 or 37L7201)[2]	18.2 GB (P/N 00N8205 or 37L7202)[2]	36.4 GB (P/N 00N8206 or 37L7203)[2]	9.1 GB (P/N 00N8207 or 37L7204)[2]	18.2 GB (P/N 00N8208 or 37L7205)[2]	36.4 GB (P/N 00N8209 or 37L7206)[2]	9.1 GB (P/N 19K0655)[4]	18.2 GB (P/N 19K0658 or 19K0656)[2]
0 GB	0GB Standard on most Base Models[5]			0GB Standard on most Base Models[5]			0GB Standard on most Base Models[5]	
9.1GB	1	-	-	1	-	-	1	-
18.2GB	2 or	1	-	2 or	1	-	2 or	1
27.3GB	3	-	-	3	-	-	3	-
36.4GB	4[3] or	2 or	1	4[3]or	2 or	1	-	2
54.6GB	-	3	-	-	3	-	-	3
72.8GB	-	4[3] or	2	-	4[3] or	2	-	4[3]
109.2GB	-	-	3	-	-	3	-	-
145.6GB (max)[3]	-	-	4[3]	-	-	4[3]	-	-

This table does not represent all possible hard disk drive (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 ± 0.2 GB unless otherwise noted.
2. Both hot-swap and non-hot-swap HDDs are listed. Select the appropriate part number for the model of xSeries 220 being configured.
3. A maximum of three hot-swap drives may be installed in hot-swap models. This configuration requires installation of a non-hot-swap HDD in Bay 4.
4. Hot-Swap models only.
5. xSeries 220 models P/N K522Xxx, K532Xxx and K542Xxx ship standard with one 18.2GB 7200 rpm Ultra160 SCSI non hot-swap hard disk drive already installed.

Part Number	Description	RPM	Height	Hot-Swap Models		Non-Hot-Swap Models	
				Bays Supported	Maximum Quantity	Bays Supported	Maximum Quantity
	Non Hot-Swap Ultra160 SCSI HDDs[1]						
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4...7	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4...7	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4...7	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4...7	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4...7	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4...7	4
19K0658	18.2GB 15,000 rpm Ultra160 SCSI HDD	15,000	SL	4	1	4...7	4
	Hot-Swap Ultra160 SCSI HDDs[2]						
37L7201	9.1GB Ultra160 SCSI Hot-Swap HDD	7200	SL	5...7	3	-	-
37L7202	18.2GB Ultra160 SCSI Hot-Swap HDD	7200	SL	5...7	3	-	-
37L7203	36.4GB Ultra160 SCSI Hot-Swap HDD	7200	SL	5...7	3	-	-
37L7204	9.1GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	5...7	3	-	-
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	5...7	3	-	-
37L7206	36.4GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	5...7	3	-	-
19K0655	9.1GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	5...7	3	-	-
19K0656	18.2GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	5...7	3	-	-

External Storage Expansion Unit[3]		Form Factor
19K11xx[6]	EXP300 Storage Expansion Unit[4, 5]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[5]	-

1.Non-hot-swap HDDs are supported in bays 4...7 of non-hot swap models and in bay 4 of hot-swap models.
2.Hot-swap HDDs are supported in bays 5...7 of hot-swap models. Bay 4 supports non-hot-swap HDDs only.
3. 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.
4. The EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
5. 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 Rack Power Cables (one for each power supply).
6.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.



Bay	Form Factor	Height	Front Access	Usage
1	133mm (5.25in)	HH	yes	IDE CD-ROM
2	133mm (5.25in)	HH	yes	open[1]
3	89mm (3.5in)	SL	yes	Diskette
4	89mm (3.5in)	SL	yes	open
5 ... 7	89mm (3.5in)	SL[2]	yes	open

1. Bay 2 does not support HDD options. It can be used for removable media devices such as tape drives.
2. These bays are configured as hot-swap bays on models K52AXxx, K53AXxx, K54AXxx.

xSeries 220 Internal SCSI Cabling

Non-Hot-Swap Models
xSeries 220 non-hot-swap models are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in multi-mode active terminator on one end of the cable. The other end of the cable is attached to the internal 68-pin connector of the integrated Ultra160 SCSI controller. SCSI devices can be connected to any of the five cable connectors. If 8-bit (narrow) devices are to be installed, a 68- to 50-pin converter P/N 32G3925 is required for each narrow device.

Hot-Swap Models
xSeries 220 hot-swap models are cabled internally with a two-drop, 16-bit wide LVD SCSI cable. One end is connected to the internal 68-pin connector of the integrated Ultra160 SCSI controller. The first drop is designed to support a SCSI device in the 3.5-inch non-hot-swap bay, while the second drop is connected to the hot-swap SCSI backplane.The SCSI backplane provides termination for the SCSI bus.

Other Configuration Alternatives
In the case where a RAID controller is used to support internal drives in a xSeries 220, the standard cable is moved from the onboard controller to the RAID adapter. To connect a tape drive to the onboard or other supported SCSI controller, the two-drop cable from Media Bay Tray and LVD Cable Kit P/N 10K2340 must be used.

External SCSI support can be obtained by installing an optional SCSI adapter or RAID controller and using appropriate external SCSI cabling.

xSeries 220 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]
	SCSI Storage Controllers[2]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[3]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5
	Networking[6]			
	Ethernet			
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...5
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...5
	Token Ring[7]			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[7]	Half	32-bit	1...5
34L5001	16/4 Token-Ring PCI Management Adapter[7]	Half	32-bit	1...5
34L5201	High-speed 100/16/4 Token-Ring PCI Management Adapter[7]	Half	32-bit	1...5
	Communications[8]			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[9]	Half	32-bit	1...5[9]
	Systems Management			
09N75xx[10]	Remote Supervisor Adapter	Half	32-bit	2

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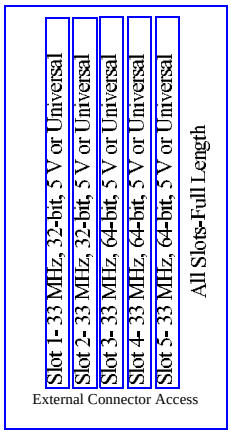


1. The xSeries 220 has five full-length, 33 MHz PCI expansion slots, three 64-bit and two 32-bit.
2. xSeries 220 has an integrated Ultra160 SCSI Controller with a single internal channel and includes a five drop, multi-mode terminated LVD SCSI cable.
3. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
4. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
6. The xSeries 220 includes an integrated full-duplex, 10/100 Mbps Ethernet controller.
7. Wake on LAN function support is provided for slot 1 only.
8. xSeries 220 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A software compatible) and one high-speed parallel port supporting devices using SSP/EPP/ECP protocols adhering to the IEEE 1284 Standard.
9. See Appendix E for details of Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
10. Where ‘xx’ represents a country specific code: 86=Europe, 87=Denmark, 88=South Africa, 89=UK, 90=Switzerland, 91=Italy, 92=Israel, 85=USA.

Part Number	Description
	Power[1,10]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Free Standing Uninterruptible Power Supply (UPS)[2]
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
14RIxxx[9]	APC Smart-UPS 1400RMB[3,10]
30RIxxx[9]	APC Smart-UPS 3000RMB[3,10]
37L6862	APC Smart-UPS 5000RMB,[4,10]
	Monitors[5]
T3347xx[8]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T31U2xx[8]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32U3xx[8]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[8]	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
11AG1xx[8]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]

1. The xSeries 220 includes a 330 W voltage sensing power supply and a single standard country power cord..
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 220 includes an integrated SVGA controller(S3 Savage4 Chipset) with 8Mb of video memory
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. 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.
8. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
9. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.
10. The xSeries 220 ships with a standard country power cord. If conversion to Rack format is being carried out, Rack Power Cable P/N 94G7448 (type C12), must be ordered to allow connection to a high voltage UPS or PDU.

Part Number	Description
	Conversion Kits
09N4300	4Ux20D Tower-to-Rack Kit[6]
	Rack and NetBAY[1,6]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (Perforated Doors)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	NetBAY22 Rack Extension Kit
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[6]
	Keyboard and Mouse[2]
28L36xx[5]	Space Saver II Keyboard[3, 4]

1 Rack installation of an xSeries 220 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. The xSeries 220 includes both a mouse and non-space saver keyboard.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
6. The xSeries 220 ships with a standard country power cord. If conversion to Rack format and connection to a high voltage UPS or PDU is being carried out, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 220 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[2, 3]	2	8	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	Y	10L7440, 03K8756
09N4042	10/20GB NS Internal SCSI Tape Drive[2, 3]	2, 4	8	89 mm (3.5”) SL or 133 mm (5.25”) HH	Y	Y	10L7440, 03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[3]	2	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”) HH	N	N/A	10L7440[4], 03K8756[5]
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[7]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[8]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	10L7440
10K2340	Media Bay Tray and LVD Cable Kit[3,5]	-	16 LVD	Internal	Y	N	03K8756

Note: All models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode terminated LVD SCSI cable and an external 0.8-mm VHDCI connector.

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.
2.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
3. For RAID configurations where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit P/N 10K2340 is required, to allow attachment of a SCSI Tape Drive to the standard Ultra160 SCSI controller.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
6. Provides a black desktop 133 mm (5.25”) half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
7. NetMEDIA Storage Expansion Unit EL (P/N 03K8756) is a black 3U, 19” rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25”) bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
8. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in an Expansion Unit P/N 03K8756 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

xSeries 220 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.

Internet Server

Part Number	Description	Quantity
K53AXxx	x220 866MHz/256KB, 128MB ECC, OPEN-HS, 48X, PCI	1
33L3142	128 MB 133Mhz SDRAM ECC RDIMM	1[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	2[2]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1
T31U2xx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 36.4 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the xSeries 200 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256 MB of system memory (expandable to 4 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
K52AXxx	x220 800MHz/256KB, 128MB ECC, OPEN-HS, 48X, PCI	1
33L3142	128 MB 133Mhz SDRAM ECC RDIMM	1[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	3[2]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1
T31U2xx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 220 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

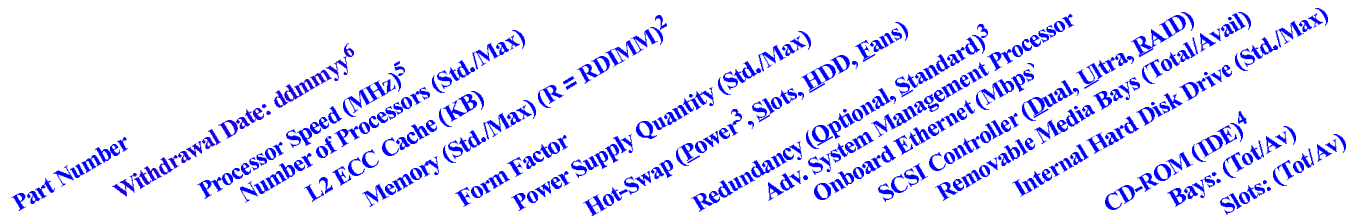
Application Server

Part Number	Description	Quantity
K542Xxx	x220 933MHz/256KB, 128MB ECC, 18.2GB, 48X, PCI	1
10K3819	933MHz upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache	1
33L3144	256 MB 133 MHz SDRAM ECC RDIMM	1[1]
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	2[2]
10K2340	Media Bay Tray and LVD Cable Kit	1[3]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive NS Internal SCSI Tape Drive	1
T31U2xx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. Three HDDs are used (in total) for RAID 5 protection. Effective capacity is two HDDs or 36.4GB
3. Contains a cable for dedicated attachment of tape to standard controller.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 220 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4 GB), and availability features such as RAID protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 230 and Netfinity 5100



xSeries 230 / Netfinity 5100 At-A-Glance Chart

xSeries 230																
K861Yxx	-	1GHz	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
K86RYxx[1]	-	1GHz	1/2	256	128MB (R)/4GB	Rack(5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
Netfinity 5100																
831YExx	30/03/01	800	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
83RYExx[1]	30/03/01	800	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
841YExx	-	866	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
84RYExx[1]	-	866	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
851YExx	-	933	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
85RYExx[1]	-	933	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5

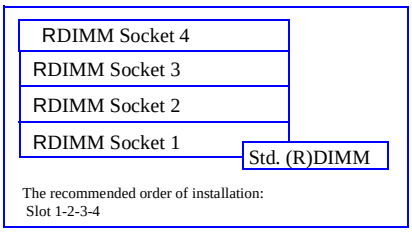
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See **Power, Monitors, Accessories** section for supported IBM racks.
2. High-speed, 133 MHz SDRAM.
3. Up to two additional 250 W Hot-Swap Redundant Power Supplies P/N 33L37xx and a single Hot-Swap Power Supply Expansion Kit P/N 37L6881 are required for power supply redundancy. See **Power, Monitors, Accessories** section for additional information.
4. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
5. Intel Pentium III processor with advanced transfer (full-speed) L2 cache and 133 MHz Front-Side Bus.
6. Not available from IBM after this date. Business Partner inventory may be available.

xSeries 230 / Netfinity 5100 Processor Upgrades

Part Number	Processor Upgrades Description	SMP Support[1]	Processor Speed Upgrade[2]
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 82xYExx	All 81xYExx
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 83xYExx	All 81xYExx to 82xYExx
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 84xYExx	All 81xYExx to 83xYExx
19K4631[3]	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 85xYExx[3]	Note [3]
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K86xYxx	All 85xYExx

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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
3. Netfinity 933 MHz Upgrade Processor P/N 19K4631 is only supported on models P/N 85xYExx due to thermal restrictions.

xSeries 230 / Netfinity 5100 Memory Configurator



The recommended order of installation:
Slot 1-2-3-4

Part Number	Memory Description[1]
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB 133 MHz SDRAM ECC RDIMM II
33L3129	1 GB 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in sequence from Socket 1 to Socket 4. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added			
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
256 MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)[2]	-	-	-	4[2]

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.

xSeries 230 / Netfinity 5100 Internal Hard Disk Drive (HDD) and External Storage Configurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)	9.1 GB (P/N 19K0655)	18.2 GB (P/N 19K0656)
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
27.3 GB	3	-	-	3	-	-	3	-
36.4 GB	4 or	2 or	1	4 or	2 or	1	4 or	2
45.5 GB	5	-	-	5	-	-	5	
54.6 GB	6 or	3	-	6 or	3	-	6 or	3
72.8 GB	-	4 or	2	-	4 or	2	-	4
91 GB	-	5	-	-	5	-	-	5
109.2 GB	-	6 or	3	-	6 or	3	-	6
145.6 GB	-	-	4	-	-	4	-	-
182 GB	-	-	5	-	-	5	-	-
218.4 GB (max.)	-	-	6	-	-	6	-	-

This table does not represent all possible hard disk drive (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 +/ - 0.2 GB unless otherwise noted.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25")	HH[1]	Yes	Open
B	133 mm (5.25")	HH[1]	Yes	Open
-	133 mm (5.25")	SL	Yes	IDE CD-ROM
-	89 mm (3.5")	SL	Yes	Diskette
C...H	HS	SL[2]	Yes	Open

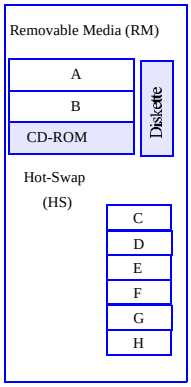
Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Hot-Swap Ultra160 SCSI HDDs				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	C...H	6
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	C...H	6
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	C...H	6
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	C...H	6

37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	C...H	6
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	C...H	6
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	C...H	6
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	C...H	6
Non-Hot-Swap Ultra2 SCSI HDDs[1]					
20L0553	9.1 GB Wide Ultra2 SCSI HDD[2]	7200	SL	A, B[3]	2
20L0554	18.2 GB Wide Ultra2 SCSI HDD[2]	7200	SL	A, B[3]	2
Associated Options					
10K2340	Media Bay Tray and LVD Cable Kit[3]	-	-	A+B	1
33L37xx[11]	250 W Hot-Swap Redundant Power Supply	-	-	-	-
37L6881	Hot-Swap Power Supply Upgrade Kit[4]	-	-	-	-

External Storage Expansion Units[5]		**Form Factor**
19K11xx[12]	EXP300 Storage Expansion Unit[6, 10]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
19K11xx[13]	FAStT 200 Storage Server[7, 8, 10]	Rack (3U)
19K11xx[14]	FAStT 200 HA Storage Server[7, 10]	Rack (3U)
19K1121	FAStT 200 Redundant RAID Controller[8]	-
00N71xx[15]	FAStT EXP500 Storage Expansion Unit[9, 10]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m)[10]	-

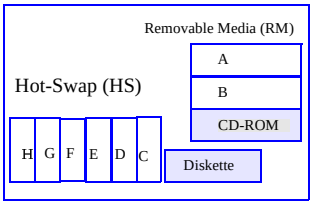
1. Two half-high (HH) bays can be combined to support a single full-high (FH) device. Installation of devices in Bays A or B may require Netfinity Hot-Swap Power Supply Expansion Kit (P/N 37L6881) and at least one Netfinity 250 W Hot-Swap Redundant Power Supply (P/N 33L37xx). Installation of HDDs in Bays A and B also requires Media Bay Tray and LVD Cable Kit (P/N 10K2340).
2. Two slim-line (SL) bays (C/D, E/F, G/H) can be combined to support a single half-high (HH) device.

Tower Model View



For clarity purposes, bay labels in these diagrams are for reference by the accompanying tables and are not the actual labels. Refer to the documentation shipped with the system for further details on actual labels.

Rack Model View



1. Installation of non hot-swap HDDs requires both the tray and the cable in the Media Bay Kit P/N 10K2340
2. Additional power may be required when installing a SCSI device in bay A or B. Configurations exceeding four SL hot-swap hard disk drives and two PCI adapters require both Hot-Swap Power Supply Upgrade Kit P/N 37L6881 and at least one optional 250 W Hot-Swap Redundant Power Supply P/N 33L37xx. Example: 3 SL HS HDD's plus 5 adapters - no additional power supply required. An optional SCSI cable is required. A two-drop terminated LVD SCSI cable is included with both Media Bay Tray and LVD Cable Kit P/N 10K2340 and Hot-Swap Power Supply Upgrade Kit P/N 37L6881.
3. Media Bay Tray and LVD Cable Kit P/N 10K2340 is required. It contains a two-drop terminated LVD SCSI cable and the hardware required to convert two half-high 5.25" removable media bays into two non-hot-swap 7200 RPM HDD bays.
4. Hot-Swap Power Supply Upgrade Kit P/N 37L6881 contains a hot-swap power backplane that supports installation for up to three hot-swap power supplies.
5. 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.
6. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with it's own standard country power cord.
7.The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
8. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
9. The FAStT EXP500 Storage Expansion Unit (P/N 00N71xx) includes dual hot-swap 350W power supplies each with it's own standard country power cord.
10. These units do 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 Rack Power Cables (one for each power supply).
11. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
12.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.
13. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
14. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
15. Where 'xx' represents a country specific 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. Country/ Language Line Cords/Publications are included as indicated.

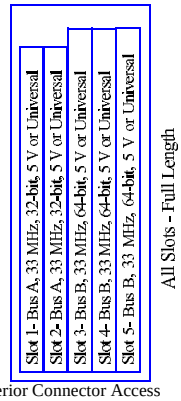
xSeries 230 / Netfinity 5100 Internal SCSI Cabling

The xSeries 230 and Netfinity 5100 contain a DASD backplane supporting six hot-swap, SCA-2 compliant drive bays. The backplane is connected to channel A of the integrated dual-channel, Ultra160 SCSI controller connector through a 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect to a supported RAID adapter rather than the integrated SCSI controller. No external SCSI port is included.

A two-drop, 16-bit LVD SCSI cable with integrated terminator is also included with the Netfinity Hot-Swap Power Supply Expansion Kit P/N 37L6881.This cable is included in the expansion kit because installation of SCSI devices in bays A and B requires additional power. The two-drop cable supports up to two internal devices in these bays. This cable can be attached to channel B of the integrated dual-channel Ultra160 SCSI controller or to a supported SCSI adapter.

xSeries 230 / Netfinity 5100 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	SCSI Storage Controllers[1]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[2]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[3]	Full	32/64-bit	1...5
37L6889	ServeRAID-4H Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32/64-bit	1...5
02K3454	PCI Wide Ultra SCSI Adapter	Half	32-bit	1...5
	Fibre Storage Controller[6]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5
	Networking[7]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...5
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...5
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[8]	Half	32-bit	1...5
34L5201	High-speed 100/16/4 Token-Ring PCI Management Adapter[8]	Half	32-bit	1...5
	Communications[9]			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[10]	Half	32-bit	1...5[10]
	Systems Management[11]			
36L96xx[18]	Netfinity Advanced System Management PCI Adapter[12]	Full	32-bit	1...5[13]
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[14]	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[15]	-	-	-
	Host Attach			
10L7368	Netfinity ESCON Adapter[16]	Full	32-bit	1...5[17]



Exterior Connector Access

1. xSeries 230 / Netfinity 5100 includes a dual-port, dual-channel Ultra160 SCSI controller for internal use only. No standard external port is available. See “Internal SCSI Cabling” for cabling alternatives.
2. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
3. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Uoltra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI .
4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
5. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
6. See Fibre Array Solutions section for additional configuration information.
7. xSeries 230 / Netfinity 5100 includes a full-duplex, 10/100 Mbps Ethernet PCI controller.
8. The Wake on LAN function of this option is not supported by this server.
9. xSeries 230 / Netfinity 5100 includes two USB ports, two serial and one parallel port.
10. See Appendix E for details of Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
11. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 230 / Netfinity 5100 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
12. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter, which requires a separate power source. Provides an integrated 10/100 Ethernet port and a PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
13. A maximum quantity of one is supported.
14. Required for all xSeries / Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) includes the contents of this option.Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
15 Contains an IBM Turbo 16/4 Token-Ring PCI card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 36L96xx), and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter’s integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
16. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
17. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
18. Where ‘xx’ represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.

Part Number	Description
	Power[1,10]
33L37xx[11]	250 W Hot-Swap Redundant Power Supply[2, 10]
37L6881	Hot-Swap Power Supply Expansion Kit[3]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Free Standing Uninterruptible Power Supply (UPS)[4]
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[4]
14RIxxx[13]	APC Smart-UPS 1400RMB[5]
30RIxxx[13]	APC Smart-UPS 3000RMB[5]
37L6862	APC Smart-UPS 5000RMB[6]
	Monitors[7]
T3347xx[12]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[8]
T31U2xx[12]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[8]
T32U3xx[12]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black[8]
T274Axx[12]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black[8]
11AG1xx[12]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black[9]

1. xSeries 230 / Netfinity 5100 include a single 250 W, hot-swap power supply and a single standard country power cord. Power supply redundancy may be achieved with the addition of optional 250 W Hot-Swap Redundant Supply P/N 33L37xx[11]. Hot-Swap Power Supply Upgrade Kit P/N 37L6881 is required when optional power supplies are to be added. Redundancy for configurations of greater than 250W requires installation of a second optional supply. Whenever SCSI devices are installed in bays A or B, both the expansion kit and a second power supply are required. Generally speaking, configurations containing greater than six PCI adapters and HDDs, in any combination, will require an additional power supply. To assist in determining when an additional power supply is required to preserve redundancy, a “Non-Redundant LED” is a standard feature.
2. 250 W Hot-Swap Redundant Power Supply P/N 33L37xx includes a single standard country power cord for connection to a low voltage wall outlet. Hot-Swap Power Supply Expansion Kit P/N 37L6881 must be installed prior to adding optional power supplies.
3. Hot-Swap Power Supply Expansion Kit P/N 37L6881 includes a hot-swap power backplane, terminated two-drop LVD SCSI cable, and mounting brackets for DLT tape drives. Required when installing a second power supply or devices in the 133-mm (5.25”) HH bays.
4. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
5. Height is 3U. See “Rack and NetBAY” for supported IBM racks.
6. Height is 5U. See “Rack and NetBAY” for supported IBM racks.
7. Netfinity 5100 uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
8. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
9. 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 keyboard tray.
10. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection of a Rack model to a high voltage UPS or PDU.
11. Where ‘xx’ refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
12. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
13. Where ‘xxx’ represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
	Conversion Kits
37L6858	5Ux24D Tower-to-Rack Kit
	Rack and NetBAY[1,8]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Keyboard and Mouse[2]
28L36xx[6]	Space Saver II Keyboard[3, 5]
28L36xx[7]	Preferred Keyboard (stealth black)[4]
28L3675	Sleek 2-Button Stealth Black Mouse

1. xSeries 230 / Netfinity 5100 rack models are housed in a 19” rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. Tower models include both a keyboard and mouse. Rack models include neither.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in “ready-to-use” position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
6. Where ‘xx’ represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/ Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where ‘xx’ represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The xSeries 230 / Netfinity 5100 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

xSeries 230 / Netfinity 5100 Tape Options

Part Number	Tape Drives	Bays Supported[1]	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[2]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	10L7440[4], 03K8756[3]
09N4040	20/40 GB DLT Internal SCSI Tape Drive[2]	A+B	8	133 mm (5.25") FH	N	Y	03K8705[4], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A+B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8705[4], 03K8756[3]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[4], 03K8756[3]
	Tape Autoloaders						
00N79xx[11]	DLT Tape Autoloader	N/A	16	Desktop	Y	-	-
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A+B	16 Ultra2 LVD	133 mm (5.25") FH	N	N	03K8756[3]
	External Tape Libraries[5]						
00N79xx[12]	DLT Tape Library	-	16	Desktop orRack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[7]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[8]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[9]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[2]	-	16 LVD	Int.	Y	N	03K8756
37L6881	Hot-Swap Power Supply Expansion Kit[1, 2, 10]	-	16 LVD	Int.	Y	N	-
33L37xx[13]	250 W Hot-Swap Redundant Power Supply	-	-	-	-	-	-

1. Whenever a SCSI device is installed in bay A or B, Hot-Swap Power Supply Expansion Kit P/N 37L6881 and a second power supply P/N 33L37xx will be required (see 'Power, Monitors, Accessories' section). Also, generally speaking, configurations containing greater than six PCI adapters and HDDs, in any combination, will require an additional power supply. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature.
2. Internal tape drives require the two-drop multi-mode terminated LVD SCSI cable included with either Media Bay Tray and LVD Cable Kit P/N 10K2340 or Hot-Swap Power Supply Expansion Kit P/N 37L6881 for connection to Channel B of the standard Ultra160 controller. No external SCSI port is available. External tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector. Refer to Appendix D: Cables-Storage Units-Controllers to select a cable for attaching the enclosure to the adapter.
3. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
4. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
5. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
6. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
7. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
8. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
9. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
10. Hot-Swap Power Supply Expansion Kit P/N 37L6881 includes a hot-swap power backplane, and two-drop multi-mode terminated LVD SCSI cable. Required when installing a second power supply.
11. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
12. 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.
13. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

xSeries 230 / Netfinity 5100 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.

Internet Server

Part Number	Description	Quantity
851YExx	Netfinity 5100 933MHz/256 KB, 128MB ECC, OPEN, 40X, PCI	1
33L3123	128MB 133MHz SDRAM ECC RDIMM II	1[1]
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	4[2]
00N8017	60/120GB 8mm M2 SCSI Tape Drive	1
T31U2xx	E54 Color Monitor 15" (350mm, 13.8" Viewable Image Size), stealth black	1
SUP102Y	APC Smart-UPS 1000	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
33L37xx	250W Hot-Swap Redundant Power Supply	1

1. For a total of 256MB of system memory.
2. Three HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is two HDDs or 18.2GB.

An internet server handles all requests from the Internet (intranet or extranet). Usually this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients as a file server does.

With this in mind the Netfinity 5100 was selected to provide an affordable price point for the growing internet server market, 256MB of system memory (expandable to 4GB, and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
K861Yxx	xSeries 230 1GHz/256KB, 128MB ECC, OPEN, 40X, PCI	1
33L3123	128MB 133MHz SDRAM ECC RDIMM II	1[1]
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	5[2]
00N8017	60/120GB 8mm M2 SCSI Tape Drive	1
T31U2xx	E54 Color Monitor 15" (350mm, 13.8" Viewable Image Size), stealth black	1
SUP102Y	APC Smart-UPS 1000	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
33L37xx	250W Hot-Swap Redundant Power Supply	1

1. For a total of 256MB of system memory.
2. Four HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective capacity is three HDDs or 27.3GB.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high end performance and fault tolerance properties of larger servers.

The sample configuration above consists of an xSeries 230 with 256MB of memory (expandable to 4GB) and 27.3GB of RAID-protected HDD space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

The configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Rack Mounted Application Server

Part Number	Description	Quantity
85RYExx	Netfinity 5100 933MHz/256 KB, 128MB ECC, OPEN, 40X, PCI (Rack 5U)	1
19K4631	933MHz/133MHz FSB/256 KB Upgrade with Pentium III Processor	1
33L3125	256MB 133MHz SDRAM ECC RDIMM II	1[1]
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	5[2]
00N8017	60/120GB 8mm M2 SCSI Tape Drive	1
T31U2xx	E54 Color Monitor 15" (350mm, 13.8" Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
33L37xx	250W Hot-Swap Redundant Power Supply	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
	Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)	
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 384MB of system memory.
2. Five HDDs are used for RAID 5 protection. Effective storage capacity is four HDDs or 36.4GB.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 230 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384MB of system memory (expandable to 4GB), and availability features such as battery-backed cache, RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

To access IBM information specific to your country via the World Wide Web, use address: http://www.ibm.com/pc

IBM xSeries 240 and Netfinity 5600

Part Number	Withdrawal Date: ddmmyy[6]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[5]	Bays: (Tot/Av)	Slots: (Tot/Av)
xSeries 240																	
K481Yxx	-	1 GHz	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
K48RYxx[1]	-	1 GHz	1/2	256	256MB (R)/4GB	Rack(5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
Netfinity 5600																	
451YExx	31/01/01	800	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
45RYExx[1]	31/01/01	800	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
461YExx	-	866	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
46RYExx[1]	-	866	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
471YExx	-	933	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
47RYExx[1]	-	933	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5

1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 Mhz Front-Side Bus.
3. High-speed, 133 MHz SDRAM.
4. Robust configurations may require optional 250W Hot-Swap Redundant Power Supply P/N 33L37xx for redundancy. See **Power, Monitor, Accessories** section for additional information.
5. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
6. Not available from IBM after this date. Business Partner inventory may be available.

xSeries 240 / Netfinity 5600 Processor Upgrades

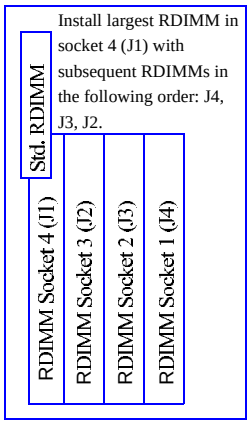
Part Number	Processor Upgrades Description	SMP Support[1]	Processor Speed Upgrade[2]
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 45xYExx	All 41xYxxx to 44xYxxx
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 46xYExx	All 41xYxxx to 45xYExx
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	All 47xYExx	All 41xYxxx to 46xYExx
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K48xYxx	-

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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 240 / Netfinity 5600 Memory Configurator

Total Memory[1]	Quantity of RDIMMs Added			
256MB (1 x 256) Models	128MB (33L3058)	256MB (33L3060)	512MB (33L3062)	1GB (33L3064)
384MB	1	-	-	-
512MB	2 or	1	-	-
640MB	3	-	-	-
768MB	-	2 or	1	-
1024MB	-	3	-	-
1280MB	-	-	2 or	1
1792MB	-	-	3	-
2048MB	-	-	4[2]	-
2304MB	-	-	-	2
3328MB	-	-	-	3
4096MB (max)[2]	-	-	-	4[2]

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. Requires removal of standard memory.



Part Number	Memory Description[1]
33L3058	128 MB, 133 MHz SDRAM ECC RDIMM
33L3060	256 MB, 133 MHz SDRAM ECC RDIMM
33L3062	512 MB, 133 MHz SDRAM ECC RDIMM
33L3064	1 GB, 133 MHz SDRAM ECC RDIMM

1. Install largest RDIMM in socket 4 (J1) with subsequent RDIMMs in the following order: J4, J3, J2.

xSeries 240 / Netfinity 5600 Internal Hard Disk Drive (HDD) and External Storage Configurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]	9.1 GB (P/N 19K0655)[2]	18.2 GB (P/N 19K0656)[2]
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
27.3 GB	3	-	-	3	-	-	3	-
36.4 GB	4 or	2 or	1	4 or	2 or	1	4 or	2
45.5 GB	5	-	-	5	-	-	5	-
54.6 GB	6 or	3	-	6 or	3	-	6 or	3
72.8 GB	-	4 or	2	-	4 or	2	-	4
91 GB	-	5	-	-	5	-	-	5
109.2 GB	-	6 or	3	-	6 or	3	-	6
145.6 GB	-	-	4	-	-	4	-	-
182 GB	-	-	5	-	-	5	-	-
218.4 GB (max.)	-	-	6	-	-	6	-	-

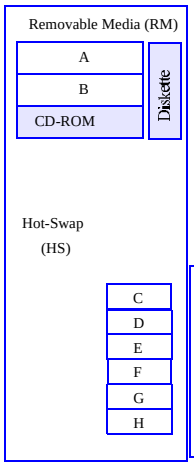
This table does not represent all possible hard disk drive (HDD) configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. xSeries 240 / Netfinity 5600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25”)	HH[1]	Yes	Open
B	133 mm (5.25”)	HH[1]	Yes	Open
-	133 mm (5.25”)	HH	Yes	IDE CD-ROM
-	89 mm (3.5”)	SL	Yes	Diskette
C...H	HS	SL[2]	Yes	Open

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.

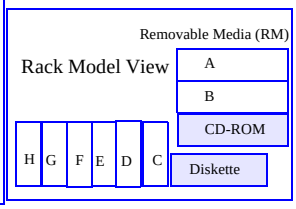
Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	C...H	6
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	C...H	6
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	C...H	6
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	C...H	6
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	C...H	6
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	C...H	6
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	C...H	6
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	C...H	6
	Associated Options				
10K2340	Media Bay Tray and LVD Cable Kit[2]	-	-	A+B	1
	External Storage Expansion Units[3]	**Form Factor**			
19K11xx[9]	EXP300 Storage Expansion Unit[4, 8]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
19K11xx[10]	FAStT 200 Storage Server[5, 6, 8]	Rack (3U)			
19K11xx[11]	FAStT 200 HA Storage Server[5, 8]	Rack (3U)			
19K1121	FAStT 200 Redundant RAID Controller[6]	-			
00N71xx[12]	FAStT EXP500 Storage Expansion Unit[7, 8]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m)[8]	-			

Tower Model View



For clarity purposes, bay labels in these diagrams are for reference by the accompanying tables and are not the actual labels. Refer to the documentation shipped with the system for further details on actual labels.

Rack Model View



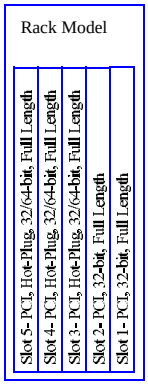
1. xSeries 240 / Netfinity 5600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Media Bay Tray and LVD Cable Kit P/N 10K2340 contains a two-drop terminated LVD SCSI cable and the hardware required to convert two half-high 5.25” removable media bays into two non-hot-swap 7200rpm HDD bays.
3. Not supported by the onboard external SCSI port. To configure an external SCSI device, select an optional SCSI controller then refer to see 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 Array Solutions section.
4. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with it’s own standard country power cord. To convert an EXP300 to a tower form factor, Netfinity EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
5.The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it’s own standard country power cord.
6. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
7. The FAStT EXP500 Storage Expansion Unit P/N 00N71xx includes dual hot-swap 350 W power supplies, each with it’s own standard country power cord.
8. These units do 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 Rack Power Cables (one for each power supply).
9.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.
10. Where ‘xx’ represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
11. Where ‘xx’ represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
12. Where ‘xx’ represents a country specific 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. Country/Language Line Cords/Publications are included as indicated.

Series 240 / Netfinity 5600 Internal SCSI Cabling

The xSeries 240 and Netfinity 5600 contain a backplane supporting six hot-swap drive bays. The backplane is connected to the integrated dual channel, wide Ultra2 SCSI controller connector through a 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect to a supported RAID adapter rather than the integrated SCSI controller. A two-drop, 16-bit SCSI cable with integrated terminator is also included with the server to support up to two internal removable media devices. This cable can be attached to the integrated SCSI controller if a RAID adapter is used to support the internal hot-swap drive bays. It can also be used to attach to a supported SCSI adapter if the integrated Ultra2 SCSI controller is utilised for the hot-swap bays. The second channel is available through an industry-standard 0.8-mm very high density connector interface (VHDCI) located on the rear panel for external use.

xSeries 240 / Netfinity 5600 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported	Hot-Plug[2]
	SCSI Storage Controllers[1]				
37L6091	ServeRAID-4L Ultra160 SCSI Controller[3]	Full	32/64-bit	1...5	X
37L6080	ServeRAID-4M Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5	X
37L6889	ServeRAID-4H Ultra160 SCSI Controller[5]	Full	32/64-bit	1...5	X
19K4646	PCI Wide Ultra160 SCSI Adapter[6]	Half	32/64-bit	1...5	-
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5	-
	Fibre Storage Controller[7]				
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5	X
	Networking[8]				
	Ethernet				
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5	X
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5	X
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5	X
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...5	X
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...5	X
	Token Ring				
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1...5	X
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1...5	X
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[9]	Half	32-bit	1...5	X
	Communications[10]				
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[11]	Half	32-bit	1...5[11]	-
	Systems Management[12]				
36L96xx[19]	Netfinity Advanced System Management PCI Adapter[13]	Full	32-bit	1...5[14]	-
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[15]	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[16]	-	-	-	-
	Host Attach				
10L7368	Netfinity ESCON Adapter[17]	Full	32-bit	1...5[18]	-



1. xSeries 240 / Netfinity 5600 has two integrated Wide Ultra2 SCSI channels. One is internal and the other is external with a 0.8-mm Very High Density Connection Interface (VHDCI).
2. Three of the five PCI slots are 32/64-bit hot-plug capable using IBM's Active™ PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat.
3.ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI..
4. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
5.ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
6. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
7. See Fibre Array Solutions section for additional configuration information.
8. xSeries 240 / Netfinity 5600 has an integrated 10/100 PCI Ethernet Controller.
9. The Wake on LAN function of this option is not supported by this server.
10. xSeries 240 / Netfinity 5600 includes two USB ports, three high-speed serial/asynchronous ports, (two NS16550A compatible, one for the Advanced System Management Processor), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
11. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
12. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 240 / Netfinity 5600 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
13. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
14. A maximum quantity of one is supported.
15. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) includes the content of this option.
Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
16. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 36L96xx), and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
17. Provides an ESCON MIC and DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
18. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
19. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.

Part Number	Description
	Power[1,8]
33L37xx[10]	250 W Hot-Swap Redundant Power Supply[8]
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Free Standing Uninterruptible Power Supply (UPS)[2]
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
14RIxxx[11]	APC Smart-UPS 1400RMB[3]
30RIxxx[11]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
	Monitors[5]
T3347xx[9]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T31U2xx[9]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32U3xx[9]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. xSeries 240 / Netfinity 5600 include two 250W hot-swap power supplies, each with its own standard country power cord. These standard power supplies are sufficient to operate fully configured systems; however optional 250W Hot-Swap Redundant Power Supply P/N 33L37xx is required to preserve redundancy if any of the following are exceeded:
Single Processor Configuration: Six SL hard disk drive (HDDs) and two PCI adapters (1 HH HDD = 2 SL, 1 tape = 2 SL, 1 PCI adapter = 2 SL)
e.g. To preserve power supply redundancy with 3 PCI adapters only 4 SL HDDs can be installed before an optional power supply is required.
Dual Processor Configuration: Four SL hard disk drives (HDDs) and two PCI adapters (1 HH HDD = 2 SL, 1 tape = 2 SL, 1 PCI adapter = 2 SL)
A "non-redundant" LED on the system unit will indicate when 250W has been exceeded. 250 W Hot-Swap Redundant Power Supply (P/N 33L37xx) includes a standard country power cord which requires an additional power source. An independent power source such as a second UPS or second circuit is not required.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. xSeries 240 / Netfinity 5600 use an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. 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 keyboard tray.
8. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection of a Rack model to a high voltage UPS or PDU.
9. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
11. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
	Conversion Kits
37L6858	5Ux24D Tower-to-Rack Kit
	Rack and NetBAY[1,8]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Keyboard and Mouse[2]
28L36xx[6]	Space Saver II Keyboard[3, 5]
28L36xx[7]	Preferred Keyboard (stealth black)[4]
28L3675	Sleek 2-Button Stealth Black Mouse

1. xSeries 240 / Netfinity 5600 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. Tower models include both a mouse and a keyboard. Rack models include neither.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The xSeries 240 / Netfinity 5600 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

xSeries 240 / Netfinity 5600 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
09N4042	10/20 GB NS Internal SCSI Tape Drive[1]	A, B	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	10L7440
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	10L7440[4], 03K8756[3]
09N4040	20/40 GB DLT Internal SCSI Tape Drive[1]	A+B	8	133 mm (5.25") FH	N	Y	03K8705[4], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A+B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8705[4], 03K8756[3]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[4], 03K8756[3]
	Tape Autoloaders						
00N79xx[10]	DLT Tape Autoloader	N/A	16	Desktop	Y	-	-
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A+B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[3]
	External Tape Libraries[5]						
00N79xx[11]	DLT Tape Library	-	16	Desktop orRack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[7]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[8]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[9]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[2,3]	-	16 LVD	Int.	Y	N	03K8756

Note: Netfinity 5600 includes a wide two-drop single-ended terminated cable which can be used for attachment of internal tape drives to the onboard Ultra2 controller when the hot-swap backplane is attached to a RAID controller. If LVD support is required, an optional LVD cable must be ordered. An external Ultra2 SCSI port is available with a 0.8-mm VHDCI connector. External tape enclosures are supported by the standard external SCSI port or PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.

1. Non-RAID Configurations: Requires PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which contains a five-drop multi-mode terminated LVD SCSI cable.
2. RAID configurations: Configurations where the hot-swap backplane is cabled to a RAID controller, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340) for support of LVD devices in LVD mode. Use of the included single-ended terminated cable with an LVD device will be limited to single-ended SCSI rules.
3. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
4. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
5. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
6. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
7. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
8. NetMEDIA Storage Expansion Unit EL (P/N 03K8756) is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
9. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
10. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
11. 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.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

xSeries 240 / Netfinity 5600 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 Application Server

Part Number	Description	Quantity	Usage
471YExx	Netfinity 5600 933MHz/256KB, 256MB ECC, Open, 40X, PCI	1	-
33L3060	256MB, 133MHz SDRAM ECC RDIMM	1	512MB total system memory
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	2	9.1GB mirrored for NOS
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	4[1]	-
00N8017	60/120 GB 8mm M2 SCSI Tape Drive	1	-
10K2340	Media Bay Tray and LVD Cable Kit	1	
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1	RAID 5
33L37xx	250W Hot-Swap Redundant Power Supply	1	Full power redundancy
T31U2xx	E54 Color Monitor 15” (350mm, 13.8” Viewable Image Size), stealth black[6]	1	-
SUP102Y	APC Smart-UPS 1000	1	UPS

1. Four HDDs are used for RAID 5 protection. Effective capacity is three HDDs or 54.6GB

This tower server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset...data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

High Availability File Server

Part Number	Description	Quantity	Usage
K481Yxx	xSeries 240 1 GHz/256KB, 256 MB ECC, Open, 40X, PCI	1	-
37L7204	9.1 GB 10K-4 Ultra2 SCSI Hot-Swap SL HDD	6[1]	-
00N8017	60/120 GB 8-mm M2 SCSI Tape Drive	1	-
10K2340	Media Bay Tray and LVD Cable Kit	1	
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	RAID 5 array, with hot-spare
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
T31U2xx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]	1	-
SUP102Y	APC Smart-UPS 1000	1	-

1. Six HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is four HDDs or 36.4GB

This tower model is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers onto one platform there is only one system to manage, both hardware and software. There is potentially less expensive for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the xSeries240 is designed for high availability. This configuration includes 56 GB of internal HDD storage, features a third power supply which provides fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 40 GB per tape...in addition to all the standard features of the xSeries 240.

IBM xSeries 330

Part Number	Withdrawal Date: ddmmyy	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Disk Drive (Std./Max)	CD-ROM (IDE)[3]	Bays: (Tot/Av)	Slots(Tot/Av)
K411Yxx[1]	30/03/01	800	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	2x10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2
K431Yxx[1]	-	866	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	2x10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2
K441Yxx[1]	-	933	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	2x10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2
K451Yxx[1]	-	1GHz	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	2x10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2

xSeries 330 At-A-Glance Chart

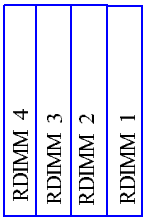
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "xSeries 330 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 MHz Front-Side Bus (FSB).
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

xSeries 330 Processor Upgrades

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
10K3810	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	K411Yxx	-
10K3806	866 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	K431Yxx	K411Yxx
10K0052	933 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	K441Yxx	K411Yxx, K431Yxx
10K0053	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	K451Yxx	K411Yxx, K431Yxx, K441Yxx

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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 330 Memory Configurator



Part Number	Memory Description[1]
33L3142	128 MB, 133 MHz SDRAM ECC RDIMM II
33L3144	256 MB, 133 MHz SDRAM ECC RDIMM II
33L3146	512 MB, 133 MHz SDRAM ECC RDIMM II
33L3152	1 GB, 133 MHz SDRAM ECC RDIMM II

1. Memory RDIMMs must be installed in sequence from RDIMM connector 1 through connector 4. RDIMM size is not relevent.

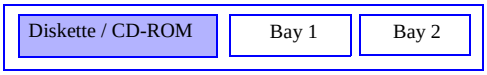
Total Memory[1]	Quantity of RDIMMs Added			
256 MB (1 x 256) Models	128 MB (33L3142)	256 MB (33L3144)	512 MB (33L3146)	1 GB (33L3152)
384MB	1	-	-	-
512 MB	2 or	1	-	-
640 MB	3	-	-	-
768 MB	-	2 or	1	-
1024 MB	-	3	-	-
1280 MB	-	-	2 or	1
1792 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2304 MB	-	-	-	2
3328 MB	-	-	-	3
4096 MB (max)[2]	-	-	-	4[2]

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.

xSeries 330 Internal Hard Disk Drive (HDD) and External Storage Configurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)	9.1 GB (P/N 19K0655)	18.2 GB (P/N 19K0656)
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
36.4 GB	-	2 or	1	-	2 or	1	-	2
72.8 GB	-	-	2	-	-	2	-	-

This table does not represent all possible hard disk drive (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 +/- 0.2 GB unless otherwise noted.



Bay	Form Factor	Height	Front Access	Usage
1[1]	89 mm (3.5")	HS	Yes	Open
2	89 mm (3.5")	HS	Yes	Open

1. Boot drive should be located in bay 1.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...2	2
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...2	2
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...2	2
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...2	2
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...2	2
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...2	2
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...2	2
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...2	2
	External Storage Expansion Units[1]	**Form Factor**			
19K11xx[7]	EXP300 Storage Expansion Unit[2, 6]	Rack (3U)			
19K11xx[8]	FAStT 200 Storage Server[3, 4, 6]	Rack (3U)			
19K11xx[9]	FAStT 200 HA Storage Server[3, 6]	Rack (3U)			
19K1121	FAStT 200 Redundant RAID Controller[4]	-			
00N71xx[10]	FAStT EXP500 Storage Expansion Unit[5, 6]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m)[6]	-			

1. xSeries 330 does not include an external SCSI connector. Select an optional SCSI controller and 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.
2. The EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own standard country power cord.
3. The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
4. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
5. The FAStT EXP500 Storage Expansion Unit (P/N 00N71xx) includes dual hot-swap 350W power supplies, each with it's own standard countyr power cord.
6. These units do 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 Rack Power Cables according to the number of power supplies.
7.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.
8. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
9. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
10. Where 'xx' represents a country specific 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. Country/ Language Line Cords/Publications are included as indicated.

xSeries 330 Internal SCSI Cabling

xSeries 330 contains a DASD backplane supporting two hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated Ultra160 SCSI controller through a 16-bit LVD SCSI cable. If internal RAID is required, the cable can be attached to the internal connector of the optional RAID adapter. The cable is of sufficient length to attach to adapters in slot 1 but not slot 2.

In configurations where external SCSI device attachment is required, a supported SCSI adapter or ServeRAID controller must be installed.

xSeries 330 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	SCSI Storage Controllers[1]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[2]	Full	32/64-bit	1
37L6080	ServeRAID-4M Ultra160 SCSI Controller[3]	Full	32/64-bit	1
37L6889	ServeRAID-4H Ultra160 SCSI Controller[4]	Full	32/64-bit	1
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32/64-bit	1, 2
02K3454	PCI Fast/Wide Ultra SCSI Adapter[6]	Half	32-bit	1, 2
	Fibre Storage Controller[7]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1, 2
	Networking[8]			
	Ethernet			
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1, 2
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1, 2
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1, 2
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1, 2
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter2 with Wake on LAN[9]	Half	32-bit	1, 2
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1, 2
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1, 2
	Communications[10]			
37L14xx	Serial I/O SST 8, 16 and 128 port adapters[11]	Half	32-bit	1, 2
	Systems Management[12]			
36L96xx[13]	Netfinity Advanced System Management PCI Adapter	Full	32-bit	1
03K9309	Netfinity Advanced System Management Interconnect Cable Kit	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection	-	-	-

Exterior Connector Access

1. xSeries 330 has an integrated single channel Ultra160 SCSI Controller.
2. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
3. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz Power PC 750 processor and provides 128 MB 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. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and one external 0.8-mm VHDCI Ultra160 connector. Support for external SCSI devices only. A five-drop terminated LVD SCSI cable is included but not supported for use in this server.
6. For use in supporting external SCSI devices such as tape drives.
7. See the Fibre Array Solutions section for additional configuration information.
8. xSeries 330 includes dual full-duplex, 10/100 Mbps Ethernet controllers.
9. The Wake on LAN function of this option is not supported by this server.
10. xSeries 330 includes two USB ports and a high speed serial/asynchronous port (NS16550A compatible).
11. See Appendix E for details on Serial I/O options and configuration limitations.
12. xSeries 330 has a single integrated system management port and a single RS485 port.
13. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.

xSeries 330 Power, Monitors, Accessories

Part Number	Description
	Power[1,10]
	Uninterruptible Power Supply (UPS)[2]
14RIxxx[11]	APC Smart-UPS 1400RMB[3]
30RIxxx[11]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Monitors[5, 6]
06P4792	Cable Chain Technology Cable Kit[6, 7]
T3347xx[12]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[8]
T31U2xx[12]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[8]
T32U3xx[12]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[8]
T274Axx[12]	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[8]
11AG1xx[12]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[9]

1. The xSeries 330 includes a worldwide, voltage sensing 200 W power supply and a standard country power cord.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 330 uses an SVGA controller (S-3 Savage4 chipset) with 8Mb of video memory.
6. Cable Chain Technology Cable Kit P/N 06P4792 (quantity one) is required for the attachment of one or multiple-chained xSeries 330s to Keyboard/Video/Mouse, either directly or via a Console Switch. If attaching directly, the Console Breakout Cable included in the Kit connects from the x330 'Out' port (or from the last x330 if multiple systems are chained together), to the K/V/M connectors. If attaching via a Console Switch, Console Cable P/N 09N4293 (2.1m/7ft) or P/N 94G7447 (3.6m/12ft) is also required and connects between the Console Breakout Cable and the Switch.
7. Each x330 ships with a Console Chaining Cable (254mm/10in), for connecting adjacent systems, thereby creating a console signal 'bus' that runs along a group of systems. The last system in the group then connects to console devices as described in note 6. Kit P/N 06P4792 also includes a longer Console Chaining Cable (2m/6.5ft) for use when the standard cable is not long enough. A maximum of 42 systems and no more than one Kit are allowed in one system chain.
8. Installation within a rack requires optional Monitor Compartment P/N94G7444.
9. 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 keyboard tray.
10. Rack Power Cable P/N 94G7448 must be ordered for power connection to a high voltage UPS or PDU.
11. Where 'xxx' is the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe
12. Where 'xx' is the appropriate country code as follows: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.

Part Number	Description
	Rack and NetBAY[1,2,11]
930842P	Netfinity Enterprise Rack[4]
930842X	Netfinity Enterprise Expansion Cabinet[4]
9306900	Netfinity Rack[2, 5]
06P6010	Netfinity Rack Front Door Kit[3]
9306910	Netfinity Rack (includes perforated front door)[5]
36L9703	Netfinity Rack Extension Kit[5]
9306200	Netfinity NetBAY22[4, 5]
36L9702	NetBAY22 Rack Extension Kit[5]
36L9701	Netfinity NetBAY3E[4, 6]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[11]
	Keyboard and Mouse[7]
06P4792	Cable Chain Technology Cable Kit[7, 8]
28L36xx[12]	Space Saver II Keyboard[9]
28L36xx[13]	Preferred Keyboard (stealth black)[10]
28L3675	Sleek 2-button Stealth Black Mouse

1. xSeries 330 is housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices. 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 the front and rear doors offer a minimum of 48% open area uniformely distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2 -inch) to prevent air re-circulation from back to front. Non-rack or non-NetBAY3E installations are not supported.
2. To enable proper cooling, the perforated door supplied in Netfinity Rack Front Door Kit P/N 06P6010 must be installed or the front door must be removed. See also Rack P/N 9306910.
3. Provides a perforated front door replacement for the standard glass door of a Netfinity Rack P/N 9306900.
4. To enable proper cooling, the front door (bezel for NetBAY3E) must be removed.
5. Although not required, the use of an appropriate Extension Kit is recommended for cooling and cable management purposes.
6. Up to three xSeries 330s are supported for installation in a NetBAY3E. and up to three NetBAY3Es are supported while installed beneath a Netfinity 8500R. An 8500R must be installed on top of the NetBAY3E.
7. Cable Chain Technology Cable Kit P/N 06P4792 (quantity one) is required for the attachment of one or multiple chained xSeries 330s to Keyboard/Video/Mouse, either directly or via a Console Switch. If attaching directly, the Console Breakout Cable included in the Kit connects from the x330 (or from the last x330 if multiple systems are chained together), to the K/V/M connectors. If attaching via a Console Switch, Console Cable P/N 09N4293 (2.1m/7ft) or P/N 94G7447 (3.6m/12ft) is also required and connects between the Console Breakout Cable and the Switch.
8. Each x330 ships with a Console Chaining Cable (254mm/10in), for connecting adjacent systems, thereby creating a console signal 'bus' that runs along a group of systems. The last system in the group then connects to console devices as described in note 7. Kit P/N 06P4792 also includes a longer Console Chaining Cable (2m/6.5ft) for use when the standard cable is not long enough. A maximum of 42 systems and no more than one Kit are allowed in one system chain.
9. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
10. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
11. The xSeries 330 ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.
12. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
13. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.

xSeries 330 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
09N4041	12/24 GB DDS/4 4-mm Internal SCSI Tape Drive	N/A[1]	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	03K8756
09N4042	10/20GB NS Internal SCSI Tape Drive	N/A[1]	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A[1]	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	03K8756[2]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A[1]	8	133 mm (5.25") FH	N	Y	03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
	Tape Autoloaders						
00N7992	120/240GB DDS/4 Tape Autoloader	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
	External Tape Libraries[3]						
00N79xx[6]	DLT Tape Library	-	16	Rack	Y	N/A	-
	External Tape Enclosures						
03K8756	NetMEDIA Storage Expansion Unit EL[4]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[5]	-	16 LVD	-	N	N	03K8756
	Associated Options						
10K2340	Media Bay Tray and LVD Cable Kit[2]	-	16 LVD	Int.	Y	N	03K8756

1. xSeries 330 does not support internal tape drives and does not include an external SCSI connector. An external tape or internal tape 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 0.8-mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable.
2.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
5. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
6. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

xSeries 330 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.

Internet Server[1]

Part Number	Description	Quantity
K441Yxx	xSeries 330 933MHz/256KB, 256MB ECC, Open, 24X, PCI	1
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2[2]
06P4792	Cable Chain Technology Cable Kit[3]	1
T31U2xx	E54 Color Monitor 15” (350mm, 13.8” Viewable Image Size), stealth black	1
28L36xx	Space Saver II Keyboard	1
14RIxxx	APC Smart-UPS 1400RMB	1

1. This example shows a 19” rackable configuration. The rack components are not included.
2. For a total of 36.4GB of internal storage.
3. A single Cable Chain Technology Cable Kit P/N 06P4792 is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

An Internet server handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients as a file server does.

With this is mind, the xSeries 330 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256MB of system memory (expandable to 4GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter.

File and Print Server[1]

Part Number	Description	Quantity
K411Yxx	xSeries 330 800MHz/256KB, 256MB ECC, Open, 24X, PCI	1
33L3142	xSeries 128MB 133MHz ECC SDRAM RDIMM	1[2]
37L7206	36.4GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2[3]
06P4792	Cable Chain Technology Cable Kit	1[4]
T31U2xx	E54 Color Monitor 15” (350mm, 13.8” Viewable Image Size), stealth black	1
28L36xx	Space Saver II Keyboard	1
14RIxxx	APC Smart-UPS 1400RMB	1

1. This example shows a 19” rackable configuration. The rack components are not included.
2. For a total of 384MB of system memory.
2. For a total of 72.8GB of internal storage.
4. A single Cable Chain Technology Cable Kit (P/N 06P4792) is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 330 with 384MB of memory and 72.8GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a UPS to keep the system protected during power surges and outages.

Application Server[1]

Part Number	Description	Quantity
K451Yxx	xSeries 330 1GHz/256KB, 256MB ECC, Open, 24X, PCI	1
10K0053	1GHz Upgrade with 133MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	1
33L3144	xSeries 256MB 133MHz ECC SDRAM RDIMM	1[2]
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2[3]
06P4792	Cable Chain Technology Cable Kit	1[4]
T31U2xx	E54 Color Monitor 15” (350mm, 13.8” Viewable Image Size), stealth black	1
28L36xx	Space Saver II Keyboard	1
14RIxxx	APC Smart-UPS 1400RMB	1

1. This example shows a 19” rackable configuration. The rack components are not included.
2. For a total of 512MB of system memory.
2. For a total of 36.4GB of internal storage.
4. A single Cable Chain Technology Cable Kit P/N 06P4792 is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 330 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 512MB of system memory (expandable to 4GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 340 and Netfinity 4500R

Part Number	Withdrawal Date: ddmmyy[7]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[6]	Bays: (Tot/Av)	Slots: (Tot/Av)
xSeries 340																	
K66RYxx[1]	-	1 GHz	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
Netfinity 4500R																	
63RYTxx[1]	30/03/01	800	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
64RYTxx[1]	-	866	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
65RYTxx[1]	-	933	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5

xSeries 340 / Netfinity 4500R At-A-Glance

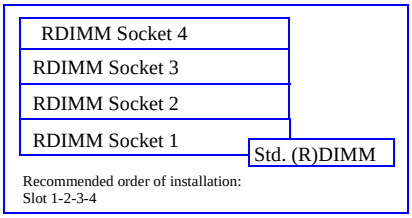
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See **Power, Monitors, Accessories** section for supported IBM racks.
2. Intel Pentium III processor with 133 MHz front-side bus.
3. Power supply redundancy requires installation of optional 270 W Hot-Swap Redundant Power Supply P/N 37L6879.
4. xSeries 340 / Netfinity 4500R includes two available removable media bays that can be converted to three slim-line (SL) hot-swap bays with the addition of optional 3-Pack Hot-Swap DASD Upgrade P/N 33L5050, thus doubling internal hard disk drive storage capacity.
5. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 which converts the two available removable media bays into three slim-line (SL) hot-swap bays.
6. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
7. Not available from IBM after this date. Business Partner inventory may be available.

xSeries 340 / Netfinity 4500R Processor Upgrades

Part Number	Processor Upgrades Description	SMP Support[1]	Processor Speed Upgrade[2]
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	61RYMxx	62RYMxx
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	63RYTxx	61RYMxx, 62RYMxx
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	64RYTxx	All 61RYxxx to 63RYxxx
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	65RYTxx	All 61RYxxx to 64RYTxx
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	K66RYxx	All 61RYxxx to 65RYxxx

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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 340 / Netfinity 4500R Memory Configurator



Part Number	Memory Description[1]
33L3123	128 MB, 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB, 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB, 133 MHz SDRAM ECC RDIMM II
33L3129	1 GB, 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in sequence from Socket 1 to Socket 4. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added			
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
256 MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)[2]	-	-	-	4[2]

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.

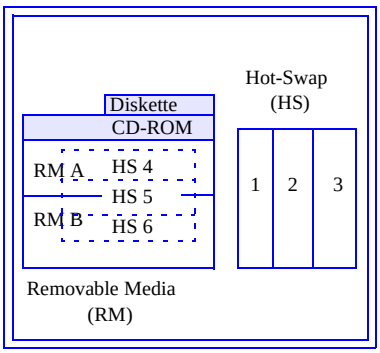
xSeries 340 / Netfinity 4500R Internal Hard Disk Drive (HDD) and External Storage Coinfigurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)	9.1 GB (P/N 19K0655)	18.2 GB (P/N 19K0656)
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
27.3 GB	3	-	-	3	-	-	3	-
36.4 GB	4[2] or	2 or	1	4[2] or	2 or	1	4[2] or	2
45.5 GB	5[2]	-	-	5[2]	-	-	5[2]	-
54.6 GB	6[2] or	3	-	6[2]	3	-	6[2] or	3
72.8 GB	-	4[2] or	2	-	4[2] or	2	-	4[2]
91 GB	-	5[2]	-	-	5[2]	-	-	5[2]
109.2 GB	-	6[2] or	3	-	6[2] or	3	-	6[2]
145.6GB	-	-	4[2]	-	-	4[2]	-	-
182 GB	-	-	5[2]	-	-	5[2]	-	-
218.4 GB (max.)	-	-	6[2]	-	-	6[2]	-	-

This table does not represent all possible hard disk drive (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 +/- 0.2 GB unless otherwise noted.
2. Requires Netfinity 3-Pack Ultra 160 Hot-Swap Expansion Kit P/N 33L5050.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	-	Yes	Diskette
-	133 mm (5.25")	-	Yes	IDE CD-ROM
1...3	HS	SL[1]	Yes	Open
A, B	133 mm (5.25")	HH[2]	Yes	Open
4...6[3]	HS	SL[1]	Yes	Open

1. Half-High devices are NOT supported.
2 Two half-high (HH) bays can be combined to support a single full-high (FH) device. By installing Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050), bays A and B are transformed into three SL hot-swap bays 4...6.
3. To enable bays 4...6, optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.



Part Number	Description	RPM	Height	Bays Supported[2]	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...6	6[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...6	6[1]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...6	6[1]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...6	6[1]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...6	6[1]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...6	6[1]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
	Associated Options				
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit[1, 2]	-	3 x SL	4...6	-

	External Storage Expansion Units[3]	**Form Factor**
19K11xx[9]	EXP300 Storage Expansion Unit[4, 8]	Rack (3U)
19K11xx[10]	FAStT 200 Storage Server[5, 6, 8]	Rack (3U)
19K11xx[11]	FAStT 200 HA Storage Server[5, 8]	Rack (3U)
19K1121	FAStT 200 Redundant RAID Controller[6]	-
00N71xx[12]	FAStT EXP500 Storage Expansion Unit[7, 8]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m)[8]	-

1. Netfinity 4500R ships with Bays 1...3 enabled. To enable installation of greater than three HDDS requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050.
2. Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 includes a hot-swap backplane and associated components for two cabling options. The backplane may be cabled directly to the second integrated SCSI channel or be supported by the same SCSI channel as the standard backplane through the use of an included repeater card.
3. Select an optional SCSI controller and 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. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with a standard country power cord..
5. The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
6. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
7. The FAStT EXP500 Storage Expansion Unit (P/N 00N71xx) includes dual hot-swap 350W power supplies, each with it's own standard country power cord.
8. These units do 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 Rack Power Cables according to the number of power supplies.
9.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.
10. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
11. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
12. Where 'xx' represents a country specific 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. Country/ Language Line Cords/Publications are included as indicated.

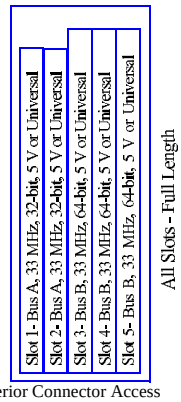
xSeries 340 / Netfinity 4500R Internal SCSI Cabling

The xSeries 340 and Netfinity 4500R contain a DASD backplane supporting three hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated Ultra160 SCSI controller through a 16-bit LVD SCSI cable. A single-drop 16-bit SCSI cable is included with the server for attachment from the second internal Ultra160 connector to a removable media bay device. If an LVD attachment is required or more than one media bay device is required, a terminated two-drop 16-bit LVD SCSI cable available in the Netfinity Media Bay Conversion Kit P/N 10K2340 must be ordered. No external SCSI port is included.

If optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 is installed in the removable media bays, four cabling options are possible. Included with this option is a 16-bit LVD SCSI cable, identical to the one used for attachment of the standard hot-swap backplane, which can be used to attach the optional 3-Pack Ultra160 Hot-Swap backplane directly to the second onboard SCSI connector or that of an optional RAID adapter. Alternatively, a repeater card and cable are included which may be used to link the standard hot-swap backplane and optional hot-swap backplane together while utilising the standard SCSI cable for attachment of the repeater card to one of the onboard SCSI connectors or that of an optional RAID adapter.

xSeries 340 / Netfinity 4500R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	SCSI Storage Controllers[1]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[2]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[3]	Full	32/64-bit	1...5
37L6889	ServeRAID-4H Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32/64-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter[6]	Half	32-bit	1...5
	Fibre Storage Controller[7]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5
	Networking[8]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...5
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...5
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCIAdapter 2 with Wake on LAN[9]	Half	32-bit	1...5
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1...5
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1...5
	Communications[10]			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[11]	Half	32-bit	1...5[11]
	Systems Management[12]			
36L96xx[19]	Netfinity Advanced System Management PCI Adapter[13]	Full	32-bit	1...5[14]
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[15]	-	-	-
36L9654	Netfinity Adv6nced System Management Token-Ring Connection[16]	-	-	-
	Host Attach			
10L7368	Netfinity ESCON™ Adapter[17]	Full	32-bit	1...5[18]



1. xSeries 340 / Netfinity 4500R include a dual-port, dual-channel Ultra160 SCSI controller for internal use only. No standard external port is available. See “Internal SCSI Cabling” for cabling alternatives. Due to Netfinity 4500R’s low profile, some adapters with connectors on the top edge may not have sufficient clearance to attach a cable. Cabling interferences are identified in the footnotes.
2. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
3. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache. The internal connectors are not accessible due to cabling interference. Four external Ultra160 0.8-mm VHDCI connectors are available.
5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
6. PCI Fast/Wide Ultra SCSI Adapter provides one external 68-pin high density connector. The internal connectors are not accessible due to a cabling interference.
7. See Fibre Array Solutions section for additional configuration information.
8. xSeries 340 / Netfinity 4500R include a full-duplex, 10/100 Mbps Ethernet PCI controller.
9. The Wake on LAN function of this option is not supported by this server.
10. xSeries 340 / Netfinity 4500R include two USB ports, two serial and one parallel port.
11. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
12. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 340 / Netfinity 4500R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
13. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter, which requires a separate power source. Provides an integrated 10/100 Ethernet port and a PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
14. A maximum quantity of one is supported.
15. Required for all xSeries and Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) includes the contents of this option.Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
16. Contains an IBM Turbo 16/4 Token-Ring PCI card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 36L96xx), and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter’s integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
17. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
18. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
19. Where ‘xx’ represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.

Part Number	Description
Power[1,8]	
37L6879	270 W Hot-Swap Redundant Power Supply[8]
94G7448	Rack Power Cable Type C12 (3.7m)[8]
Uninterruptible Power Supply (UPS)[2]	
14RIxxx[10]	APC Smart-UPS 1400RMB[3]
30RIxxx[10]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
	Monitors[5]
T3347xx[9]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T31U2xx[9]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32U3xx[9]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17" (406.4-mm, 16" Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. xSeries 340 / Netfinity 4500R include a single 270 W, hot-swap power supply and a single standard country power cord. Power supply redundancy can be achieved with the addition of optional 270 W Hot-Swap Redundant Supply P/N 37L6879.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. xSeries 340 / Netfinity 4500R use an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. 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 keyboard tray.
8. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection to a high voltage UPS or PDU.
9. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
Rack and NetBAY[1,8]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[8]
Keyboard and Mouse[2]	
28L36xx[6]	Space Saver II Keyboard[3, 5]
28L36xx[7]	Preferred Keyboard (stealth black)[4]
28L3675	Sleek 2-Button Stealth Black Mouse

1. xSeries 340 / Netfinity 4500R are housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. xSeries 340 / Netfinity 4500R ship without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The xSeries 340 / Netfinity 4500R ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

xSeries 340 / Netfinity 4500R Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N[3]	N/A	03K8756[1]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	A+B	8	133 mm (5.25") FH	N[3]	Y	03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A+B	16 Ultra2 LVD	133 mm (5.25") FH	N[3]	N/A	03K8756[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N[3]	N/A	03K8756[1]
Tape Autoloaders							
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A+B	16 Ultra2 LVD	133 mm (5.25") FH	N[3]	N/A	03K8756[1]
External Tape Libraries[4]							
00N79xx[7]	DLT Tape Library	-	16	Rack	Y	N/A	-
External Tape Enclosures							
03K8756	NetMEDIA Storage Expansion Unit EL[5]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[6]	-	16 LVD	-	N	N	03K8756
Associated Options							
10K2340	Media Bay Tray and LVD Cable Kit[1,2]	-	16 LVD	Int.	Y	N	03K8756

Note: xSeries 340 / 4500R includes a single drop, 16-bit, single-ended, non-terminated SCSI cable for attachment of a device in Bay A or B to the second integrated Ultra160 SCSI channel or supported adapter. No external SCSI port is available. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.
1.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop multi-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, LVD SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
3. Termination requires installation of the multi-mode terminated, two-drop, LVD SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340)
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. NetMEDIA Storage Expansion Unit EL (P/N 03K8756) is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
6. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
7. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

xSeries 340 / Netfinity 4500R 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.

Internet Server

Part Number	Description	Quantity
65RYTxx	Netfinity 4500R 933MHz/256 KB, 128 MB ECC, OPEN, 24X, PCI	1
33L3123	128 MB SDRAM ECC RDIMM II	1[1]
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	3[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
T31U2xx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
37L6879	270 W Hot-Swap Redundant Power Supply	1
	Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)	
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 256 MB of system memory.
2. Three HDDs are used for RAID 5 protection. Effective storage capacity is two HDDs or 18.2GB.

An internet server handles all requests from the Internet (intranet or extranet). Usually this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients as a file server does.

With this in mind the Netfinity 4500R was selected to provide an affordable price point for the growing internet server market, 256 MB of system memory (expandable to 4 GB), and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

Application Server

Part Number	Description	Quantity
K66RYxx	xSeries 340 1GHz/256 KB, 128 MB ECC, OPEN, 24X, PCI	1
19K4630	1GHz Upgrade with 133 FSB and 256 KB Advanced Transfer Cache Pentium III Processor	1
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II	1[1]
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD[2]	3[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
T31U2xx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
37L6879	Netfinity 270 W Hot-Swap Redundant Power Supply	1
14RIxxx	APC Smart-UPS 1400RMB	1
	Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)	
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 384 MB of system memory.
2. Three HDDs are used for RAID 5 protection. Effective storage capacity is two HDDs or 36.4GB.

An application server is designed to handle a high workload while providing application serving requirements for users. With this in mind, the xSeries 340 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4GB),and availability features such as battery-backed cache, RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

IBM Netfinity 6000R Configurator

Part Number	Withdrawal Date: ddmmyy	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[5]	Bays: (Tot/Av)	Slots: (Tot/Av)
21RYMxx[1]	-	700	1/4	1024	512MB(R)/16GB	Rack(4U)	1/3	P, S, H,F	S-Fans O-Power[4]	Y	10/100	D,U160	2/0	0/218.4 GB	40X-17X	8/6[6]	6/6
22RYMxx[1]	-	700	1/4	2048	512MB(R)/16GB	Rack(4U)	1/3	P, S, H,F	S-Fans O-Power[4]	Y	10/100	D,U160	2/0	0/218.4 GB	40X-17X	8/6[6]	6/6

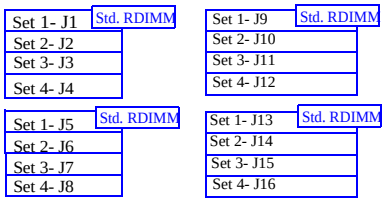
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 6000R Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with full speed ECC L2 cache and 100 MHz access to memory and I/O buses. IBM intends to make available a Netfinity 6000R model containing an Intel 800 MHz/2 MB L2 Cache Pentium II Xeon processor when Intel makes this processor generally available to the marketplace.
3. Advanced Chipkill ECC memory corrects two-, three-, and four-bit memory errors.
4. N+1 power supply redundancy requires a minimum of one optional Netfinity 270 W Hot-Swap Redundant Power Supply P/N 37L6879. Robust configurations may require two. See "Power" under "Netfinity 6000R Power, Monitors, Accessories" for additional information.
5. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
6. Netfinity 6000R includes three hot-swap bays. Optional Netfinity 3-Pack Ultra 160 Hot-Swap Expansion Kit P/N 33L5050 expands the total hot-swap bays to six.

Netfinity 6000R Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
00N7946	Netfinity 700 MHz/1 MB Upgrade with Pentium III Xeon Processor	21RYMxx	-
00N7944	Netfinity 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	22RYMxx	21RYMxx

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size. Processors must be installed in numerical order from slot 1 to slot 4.
2. Requires removal of the standard processor. A maximum of four 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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 6000R Memory Configurator



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]			
	128 MB (P/N 33L3113)	256 MB (P/N 33L3115)	512 MB (P/N 33L3117)	1 GB (P/N 33L3119)
512 MB	4 x 128 RDIMMs standard	-	-	-
1.0 GB	4	-	-	-
1.5 GB	-	4	-	-
2.0 GB	4	4	-	-
2.5 GB	-	8	-	-
3.0 GB	4	-	4	-
4 GB	4	4	4	-
5 GB	4	-	8	-
6 GB[3]	-	8	8	-
7 GB[3]	-	4	12	-
8 GB[3]	-	-	16	-
9 GB	4	-	-	8
10 GB[3]	-	-	12	4
12 GB[3]	-	-	8	8
14 GB[3]	-	-	4	12
16 GB (max)[3]	-	-	-	16[3]

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. Example: For 2.0 GB, order 4 x 33L3113 plus 4 x 33l3115.
3. Requires removal of standard RDIMMs.

Part Number	Memory Description[1]
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4. Chipkill support is provided on the memory card.

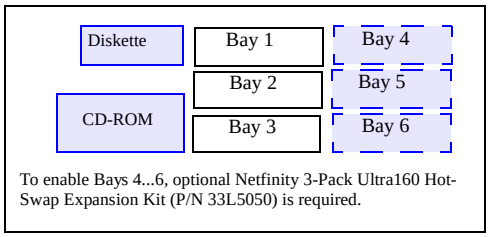
Netfinity 6000R Internal Hard Disk Drive (HDD) and External Storage Configurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)	9.1 GB (P/N 19K0655)	18.2 GB (P/N 19K0656)
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
27.3 GB	3	-	-	3	-	-	3	-
36.4 GB	4[2] or	2 or	1	4[2] or	2 or	1	4[2] or	2
45.5 GB	5[2]	-	-	5[2]	-	-	5[2]	-
54.6 GB	6[2] or	3	-	6[2] or	3	-	6[2] or	3
72.8 GB	-	4[2] or	2	-	4[2] or	2	-	4[2]
91 GB	-	5[2]	-	-	5[2]	-	-	5[2]
109.2 GB	-	6[2] or	3	-	6[2] or	3	-	6[2]
145.6GB	-	-	4[2]	-	-	4[2]	-	-
182GB	-	-	5[2]	-	-	5[2]	-	-
218.4GB (max)	-	-	6[2]	-	-	6[2]	-	-

This table does not represent all possible hard disk drive (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 +/- 0.2 GB unless otherwise noted.
2. Requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	SL	Yes	Diskette
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
1...3	HS	SL[1]	Yes	Open
4...6[2]	HS	SL[1]	Yes	Open

1. Half-high (HH) devices are NOT supported.
2. To enable Bays 4...6, optional Netfinity 3-Pack Utra160 Hot-Swap Expansion Kit P/N 33L5050 is required.



To enable Bays 4...6, optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.

Part Number	Description	RPM	Height	Bays Supported[2]	Max. Qty.
Ultra160 Hard Disk Drives (HDD)					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...6	6[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...6	6[1]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1...6	6[1]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...6	6[1]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...6	6[1]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1...6	6[1]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
Associated Options					
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit[1, 2]	-	3 x SL	4...6	-

External Storage Expansion Units[3]		Form Factor
19K11xx[9]	EXP300 Storage Expansion Unit[4, 8]	Rack (3U)
19K11xx[10]	FAStT 200 Storage Server[5, 6, 8]	Rack (3U)
19K11xx[11]	FAStT 200 HA Storage Server[5, 8]	Rack (3U)
19K1121	FAStT 200 Redundant RAID Controller[6]	-
00N71xx[12]	FAStT EXP500 Storage Expansion Unit[7, 8]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[8]	-

1. Netfinity 6000R ships with bays 1...3 enabled. To enable installation of greater than three HDDs requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050.
2. Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 is required to enable bays 4 to 6. It includes a hot-swap backplane and associated components for two cabling options. Within the option are two 16-bit LVD SCSI cables. One can be attached from the 3-pack Ultra160 Hot-Swap backplane to the second connector of the dual-channel Ultra160 SCSI controller, the other, through the use of a repeater card included with the option, can be cabled directly to the standard backplane. Utilising the second channel will eliminate the possibility of attaching external devices to that channel.
3. Not supported by the onboard external SCSI port. 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. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with it's own standard country power cord.
5. The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
6. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
7. The FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350W power supplies, each with it's own standard country power cord.
8. These units do 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 Rack Power Cables according to the number of power supplies.
9. 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.
10. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
11. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
12. Where 'xx' represents a country specific 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. Country/ Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

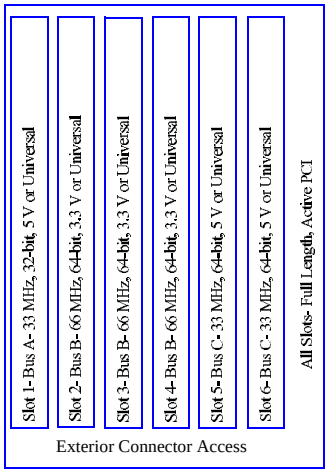
The Netfinity 6000R contains a DASD backplane supporting three hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated dual-channel Ultra160 SCSI controller through a 16-bit LVD SCSI cable. An optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) can be installed to provide additional internal HDD storage capacity. Within this option are two 16-bit LVD SCSI cables. One can be attached from the 3-Pack Ultra Hot-Swap backplane to the second connector of the dual-channel Ultra160 SCSI controller, the other, through the use of a repeater card included with the option, can be cabled directly to the standard backplane.

In configurations where external SCSI device attachment is required instead of additional internal HDD storage, a second 16-bit LVD SCSI cable is included with the server. One end of the cable can be attached to the second Ultra160 connector and the other is attached to the external 0.8-mm VHDCI connector on the back of the chassis. This provides an external connection to support LVDS devices.

Netfinity 6000R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	SCSI Storage Controllers[3]						
37L6091	ServeRAID-4L Ultra160 SCSI Controller[5]	Full	32/64-bit	1...6[4]	X	Universal	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[6]	Full	32/64-bit	1...6[4]	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1...6[4]	X	Universal	33
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1, 5, 6	-	5	33
19K4646	PCI Wide Ultra160 SCSI Adapter[8]	Half	32/64-bit	1...6	-	Universal	66
	Fibre Storage Controller[9]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...6	X	Universal	66
	Networking[10]						
	Ethernet						
09N9901	Netfinity 10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...6[4]	X	Universal	33
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...6[4]	X	Universal	33
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...6[4]	X	Universal	33
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...6[4]	X	Universal	33
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...6	X	Universal	66
	Token Ring						
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[11]	Half	32-bit	1...6[4]	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter[11]	Half	32-bit	1...6[4]	X	Universal	33
	Communications[12]						
37L14xx	Serial I/O SST 8, 16, and 128 port adapters[13]	Half	32-bit	1, 5, 6[13]	-	5	33
	Systems Management[14]						
36L96xx[19]	Netfinity Advanced System Management PCI Adapter[15, 16]	Full	32-bit	1, 5, 6[16]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[17]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[18]	-	-	-	-	-	-

1.The 5 V - 33 MHz slots support Universal or 5 V adapters. A universal voltage-66 MHz adapter plugged into these slots will operate at 33 MHz.The 3.3 V slots support universal or 3.3 V adapters. A universal voltage-33 MHz adapter plugged into these slots limits a 66 MHz PCI adapter installed on the same bus to 33 MHz.
2. All six slots are full length hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat
3. Netfinity 6000R includes a dual-port, dual-channel Ultra160 SCSI controller. See "Internal SCSI Cabling" for cabling alternatives.
4. Installation of a 33 MHz adapter into a Bus B 66 MHz slot will slow operation of all Bus B slots to 33 MHz.
5. Netfinity ServeRAID-4L Ultra160 SCSI controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
6. Netfinity ServeRAID-4M Ultra160 SCSI controller is powered by a 100MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. Netfinity ServeRAID-4H Ultra160 SCSI controller is powered by a 266MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
9. See Fibre Array Solutions section for additional configuration information.
10. Netfinity 6000R has an integrated 10/100 PCI Ethernet Controller.
11. The Wake on LAN function of this option is not supported by this server.
12. Netfinity 6000R includes two USB ports, two serial and one parallel port.
13. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
14. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 6000R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter P/N 36L96xx and Netfinity Advanced System Management Interconnect Cable Kit P/N 03K9309 additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
15. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection P/N 36L9654.
16. A maximum quantity of one is supported.
17. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX to 4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
18. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter, and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
19. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.



Netfinity 6000R Power, Monitors, Accessories

Part Number	Description
Power[1,9]	
37L6879	270 W Hot-Swap Redundant Power Supply[2,9]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[9]
Uninterruptible Power Supply (UPS)[3]	
14RIxxx[11]	APC Smart-UPS 1400RMB[4]
30RIxxx[11]	APC Smart-UPS 3000RMB[4]
37L6862	APC Smart-UPS 5000RMB[5]
Monitors[6]	
T3347xx[10]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[7]
T31U2xx[10]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[7]
T32U3xx[10]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[7]
T274Axx[10]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[7]
11AG1xx[10]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[8]

Part Number	Description
Rack and NetBAY[1,8]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	Netfinity NetBAY22 Rack Extension Kit
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[8]
Keyboard and Mouse[2]	
28L36xx[6]	Space Saver II Keyboard[3, 4]
28L36xx[7]	Preferred Keyboard (stealth black)[5]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Netfinity 6000R systems include a single 270 W, hot-swap power supply. N+1 power supply redundancy may be achieved with the addition of optional 270 W Hot-Swap Redundant Power Supply P/N 37L6879. Redundancy for configurations of greater than 270 W requires installation of a second optional supply. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 6000R. The following table is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Non-Redundant
	Up to two processors
1	Up to three PCI adapters
	Up to three HDDs
	Up to eight memory RDIMMs

2. Netfinity 270 W Hot-Swap Redundant Power Supply P/N 37L6879 includes a single standard country power cord.
3. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
4. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
5. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
6. Netfinity 6000R uses an SVGA controller (S3 Savage4 chipset) with 8 MB 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 P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
9. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection to a high voltage UPS or PDU.
10. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
11. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe

1. Netfinity 6000R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See "IBM Netfinity Rack Cabinet and Options" section for IBM rack supported devices.
2. Netfinity 6000R ships without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
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. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The Netfinity 6000R ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

Netfinity 6000R Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A[1]	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	03K8756[2]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A[1]	8	133 mm (5.25") FH	N	Y	03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	03K8756[2]
Tape Autoloaders							
00N7992	120/240GB DDS/4 Tape Autoloader	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
External Tape Libraries[3]							
00N79xx[6]	DLT Tape Library	-	16	Rack	Y	N/A	-
External Tape Enclosures							
03K8756	NetMEDIA Storage Expansion Unit EL[4]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[5]	-	16 LVD	-	N	N	03K8756
Associated Options							
10K2340	Media Bay Tray and LVD Cable Kit[2]	-	16 LVD	Int.	Y	N	03K8756

1. Netfinity 6000R does not support internal tape drives. An external tape or tape enclosure must be used. If not used internally, the second integrated Ultra160 connector may be routed to an external 0.8-mm VHDCI connector with a cable included with the server. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable.
2. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
5. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
6. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1,82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

NOTE: Additional tape details can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

Netfinity 6000R 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.

Internet Server

Part Number	Description	Quantity
21RYMxx	Netfinity 6000R 700/1MB Xeon, 512MB ECC, Open, 40X, PCI	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit	1
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	4[1]
00N8017	20/40GB 8mm Internal SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
03K8756	NetMEDIA Storage Expansion Unit EL	1
03K9310	Netfinity 2M Ultra2 SCSI Cable	1
T31U2xx	E54 Color Monitor 15" (350mm, 13.8" Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)		
9306200	Netfinity NetBAY22™	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. Four HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is two HDDs or 18.2GB

An Internet server handles all requests from the Internet (intranet or extranet). Usually, this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients as a file server does.

With this in mind, the IBM Netfinity 6000R was selected to provide an affordable price point for the growing internet server market, 512MB of system memory (expandable to 16GB), and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

Application Server

Part Number	Description	Quantity
22RYMxx	Netfinity 6000R 700/2 MB Xeon, 512 MB ECC, Open, 40X, PCI	1
00N7944	700 MHz/2 MB Upgrade with Pentium III Xeon Processor	3
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4[1]
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	4[1]
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit	1
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	4[2]
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
03K8756	NetMEDIA Storage Expansion Unit EL	1
10L7113	NetMEDIA Systems Management Adapter	1
03K9310	Netfinity 2 M Ultra2 SCSI Cable	1
T31U2xx	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
37L6879	270 W Hot-Swap Redundant Power Supply	2
Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)		
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 2 GB of system memory.
2. Four HDDs are used for RAID 5 protection. Effective storage capacity is three HDDs or 109.2GB

An application server is designed to handle a high workload while providing application serving requirements for users. With this in mind, the IBM Netfinity 6000R was selected to provide an affordable price point for an application server, with four-way Pentium III Xeon processing, 2 GB of system memory (expandable to 16 GB), and availability features such as battery-backed cache RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

IBM Netfinity 7100 Configurator

Part Number	Withdrawal Date:ddmmyy[4]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[3]	Bays: (Tot/Av)	Slots: (T/A)
631YMxx	-	700	1/4	1024	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
63RYMxx[1]	-	700	1/4	1024	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
641YMxx	-	700	1/4	2048	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
64RYMxx[1]	-	700	1/4	2048	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6

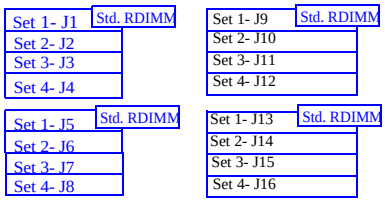
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 7100 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache and 100 MHz access to memory and I/O buses.
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
4. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 7100 Processor Upgrades

Part Number	Processor Upgrades Description	SMP Support[1]	Processor Speed Upgrade[2]
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	63xYMxx	All 61xYxxx to 62xYxxx
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	64xYMxx	All 61xYxxx to 63xYxxx

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four 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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 7100 Memory Configurator



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]				
	64 MB (P/N 33L3067)	128 MB (P/N 33L3113)	256 MB (P/N 33L3115)	512 MB (P/N 33L3117)	1 GB (P/N 33L3119)
256 MB	4 x 64 RDIMMs Standard	-	-	-	-
512 MB	4	-	-	-	-
768 MB	-	4	-	-	-
1.0 GB	4	4	-	-	-
1.2 GB	-	-	4	-	-
1.7 GB	-	4	4	-	-
2.0 GB	4	4	4	-	-
2.7 GB	-	4	-	4	-
3.0 GB	4	4	-	4	-
3.2 GB	-	-	4	4	-
3.7 GB	-	4	4	4	-
4 GB[3]	-	8	4	4	-
5 GB[3]	-	-	12	4	-
6 GB[3]	-	-	8	8	-
7 GB[3]	-	-	4	12	-
8 GB[3]	-	-	-	16	-
9 GB[3]	-	-	4	8	4
10 GB[3]	-	-	-	12	4
12 GB[3]	-	-	-	8	8
14 GB[3]	-	-	-	4	12
16 GB (max)[3]	-	-	-	-	16

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. Example: For 1.0 GB, order 4 x P/N 33L3067 and 4 x P/N 33L3113.
3. Requires removal of standard memory DIMMs.

Part Number	Memory Description[1]	Upgrade 10K2169 Compatible[2]
33L3067	Netfinity 64 MB, 100 MHz ECC SDRAM RDIMM	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	X
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	X
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM	X
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM	X
10K2169	Netfinity Active PCI/Chipkill Upgrade Kit[3]	X

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.
2. Memory designated by an “X” may be used with NetfinityActive PCI/Chipkill Upgrade Kit P/N 10K2169.
3. Netfinity Active PCI/Chipkill™ Upgrade Kit P/N 10K2169 provides an upgrade to hot-swap PCI slots and “Chipkill” ECC memory.

Netfinity 7100 Internal Hard Disk Drive (HDD) and External Storage Configurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]	9.1 GB (P/N 19K0655)[2]	18.2 GB (P/N 19K0656)[2]
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
27.3 GB	3	-	-	3	-	-	3	-
36.4 GB	4 or	2 or	1	4 or	2 or	1	4 or	2
45.5 GB	5	-	-	5	-	-	5	-
54.6 GB	6 or	3	-	6 or	3	-	6 or	3
63.7GB	7	-	-	7	-	-	7	-
72.8 GB	8 or	4 or	2	8 or	4 or	2	8 or	4
81.9GB	9	-	-	9	-	-	9	-
91 GB	10 or	5	-	10 or	5	-	10 or	5
109.2 GB	-	6 or	3	-	6 or	3	-	6
127.4GB	-	7	-	-	7	-	-	7
145.6GB	-	8 or	4	-	8 or	4	-	8
163.8GB	-	9	-	-	9	-	-	9
182GB	-	10 or	5	-	10 or	5	-	10
218.4GB	-	-	6	-	-	6	-	-
254.8GB	-	-	7	-	-	7	-	-
291.2 GB	-	-	8	-	-	8	-	-
327.6 GB	-	-	9	-	-	9	-	-
364 GB (max)	-	-	10	-	-	10	-	-

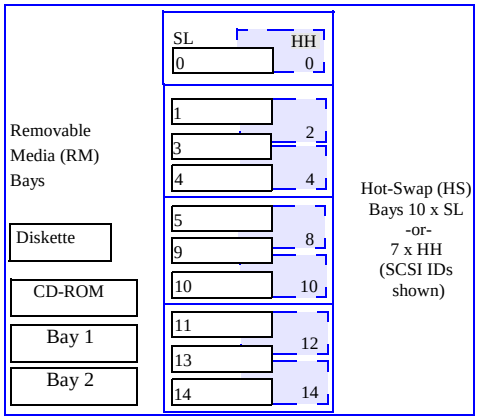
This table does not represent all possible hard disk drive (HDD) configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 7100 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5”)	SL	Yes	Diskette
-	133 mm (5.25”)	HH	Yes	IDE CD-ROM
RM 1	133 mm (5.25”)	HH[1]	Yes	Open
RM 2	133 mm (5.25”)	HH[1]	Yes	Open
1...10 or 1...7	HS	SL or HH[2]	Yes	Open
NB3[3]	19” Rack	3U	Yes	Open

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device

2. The top bay is HH; all others are configured in groups of 3 SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

3. Tower configured systems support installation of up to 3 NetBAY3s. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.



Netfinity NetBAY3 (NB3)
(Optional on Tower Configurations)

1. The top bay is HH; all others are configured in groups of three SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	See diagram	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	See diagram	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	See diagram	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	See diagram	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	See diagram	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	See diagram	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10

	External Storage Expansion Units[2]	Form Factor
19K11xx[8]	EXP300 Storage Expansion Unit[3, 7]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
19K11xx[9]	FAStT 200 Storage Server[4, 5, 7]	Rack (3U)
19K11xx[10]	FAStT 200 HA Storage Server[4, 7]	Rack (3U)
19K1121	FAStT 200 Redundant RAID Controller[5]	-
00N71xx[11]	FAStT EXP500 Storage Expansion Unit[6,7]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m, 12ft)[7]	-

1. Netfinity 7100 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. 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.
3. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W power supplies, each with it’s own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
4. The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it’s own standard country power cord.
5. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
6. The FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350 W power supplies, each with it’s own standard country power cord..
7. These units do 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 Rack Power Cables according to the number of power supplies.

8.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.
9. Where ‘xx’ represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
10. Where ‘xx’ represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
11. Where ‘xx’ represents a country specific 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. Country/Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

The Netfinity 7100 contains a DASD backplane supporting ten hot-swap, SCA-2 compliant drive bays. The backplane is connected to Channel B of the integrated dual-channel, Wide Ultra2 SCSI controller through a 16-bit LVD SCSI cable. Channel A only supports external SCSI attachment and is cabled directly to the external 0.8mm VHDCI SCSI connector. To support devices in the internal 133/89-mm (5.25/3.5-inch) half-high bays, a two-drop, 16-bit LVD SCSI cable with integrated terminator is included with the server. This cable can be used to connect to an optional SCSI adapter or, in the case of RAID configurations where the backplane cable is attached to an optional RAID adapter, it can be connected to the Channel B connector.

Netfinity 7100 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	SCSI Storage Controllers[3]						
37L6091	ServeRAID-4L Ultra160 SCSI Controller[5]	Full	32/64-bit	1...6[4]	X[2]	Universal	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[6]	Full	32/64-bit	1...6[4]	X[2]	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1...6[4]	X[2]	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[8]	Half	32/64-bit	1...6	-	Universal	66
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	3...6	-	5	33
	Fibre Storage Controller[9]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...6	X[2]	Universal	66
	Networking[10]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...6[4]	X[2]	Universal	33
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...6[4]	X[2]	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...6[4]	X[2]	Universal	33
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...6[4]	X[2]	Universal	33
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...6	X[2]	Universal	66
	Token Ring						
34L5001	16/4 Token-Ring PCI Management Adapter[11]	Half	32-bit	1...6[4]	X[2]	Universal	33
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[11]	Half	32-bit	1...6[4]	X[2]	Universal	33
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter[11]	Half	32-bit	1...6[4]	X[2]	Universal	33
	Communications[12]						
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[13]	Half	32-bit	3...6[13]	-	5	33
	Systems Management[14]						
36L96xx[21]	Netfinity Advanced System Management PCI Adapter[15, 16]	Full	32-bit	3...6[16]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[17]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[18]	-	-	-	-	-	-
	Host Attach						
10L7368	Netfinity ESCON Adapter[19, 20]	Full	32-bit	3...6[20]	-	5	33
	Other						
10K2169	Netfinity Active PCI/Chipkill Upgrade Kit[2]	-	-	3...6	X[2]	-	-

1.The 5 V slots support Universal or 5 V adapters. The 3.3 V slots support 3.3 V adapters. A Universal Keyed 66 MHz adapter plugged into a 33 MHz slot will operate at 33 MHz. A Universal Keyed 33 MHz adapter plugged into a 66 MHz slot limits other adapters installed on the same bus to 33 MHz.
2. Netfinity 7100 does not ship with hot-plug PCI slots. The addition of optional Netfinity Active PCI/Chipkill Upgrade Kit P/N 10K2169 provides slots 3-6 with hot-plug capability using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat
3.Netfinity 7100 includes a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller with one internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI).
4. Installation of a 33 MHz adapter into a Bus A 66 MHz slot will slow operation of all Bus A slots to 33 MHz.
5. Netfinity ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI.
6. Netfinity ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI.
7. Netfinity ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
8. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
9. See Netfinity Fibre Array Solutions section for additional configuration information.
10. Netfinity 7100 includes a full-duplex, 10/100 Mbps Ethernet PCI Controller.
11. The Wake on LAN function of this option is not supported by this server.
12. Netfinity 7100 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A compatible), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
13. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
14. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 7100 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter P/N 36L96xx and Netfinity Advanced System Management Interconnect Cable Kit P/N 03K9309 additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
15. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection P/N 36L9654.
16. A maximum quantity of one is supported.
17. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that is to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
18. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter), and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware access URL www.pc.ibm.com/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable files", and finally "Advanced Systems Management".
19. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
20. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
21. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.

Slot 1- Bus A- 66 MHz- 3.3 V or Universal
Slot 2- Bus A- 66 MHz- 3.3 V or Universal
Slot 3- Bus B- 33 MHz- 5 V or Universal
Slot 4- Bus B- 33 MHz- 5 V or Universal
Slot 5- Bus B- 33 MHz- 5 V or Universal
Slot 6- Bus B- 33 MHz- 5 V or Universal
All Slots- Full Length, 64-bit

Netfinity 7100 Power, Monitors, Accessories

Part Number	Description
Power[1,9]	
33L37xx[10]	250 W Hot-Swap Redundant Power Supply[9]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[9]
Uninterruptable Power Supply (UPS)[2]	
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
14RIxxx[12]	APC Smart-UPS 1400RMB[3]
30RIxxx[12]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
Monitors[5]	
T3347xx[11]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T31U2xx[11]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32U3xx[11]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[11]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
11AG1xx[11]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

Part Number	Description
Conversion Kits	
37L6860	8Ux24D Rack-to-Tower Kit[1]
37L6859	8Ux24D Tower-to-Rack Kit
Rack and NetBAY[2,10]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated door)
9306200	Netfinity NetBAY22
10L6912	Netfinity NetBAY3[3]
10L6913	Netfinity Caster Set
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[10]
Keyboard and Mouse[4]	
28L36xx[8]	Space Saver II Keyboard[5, 7]
28L36xx[9]	Preferred Keyboard (stealth black)[6]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Netfinity 7100 includes two 250W hot-swap redundant power supplies, with the ability to accept up to two additional 250 W Hot-Swap Redundant Power Supplies P/N 33L37xx. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 7100. Predicting whether or not a particular configuration will require an additional power supply for redundancy is very complex. However, once the system is installed, the "Non-Redundant LED" will indicate when an additional power supply is required. The following sample configuration is provided as a reference.

Power Supply Quan.	System Configuration Supported
Typical Non-Redundant Configuration	
2	2 x Processors 3 x PCI Adapters 4 x Half-High or 5 Slim-Line HDDs 8 x 512 MB RDIMMs
Typical Redundant Configuration	
3[8]	4 x Processors 6 x PCI Adapters 7 x Half-High or 10 Slim-Line HDDs 16 x 512 MB RDIMMs
4	Full Configuration with Redundancy

1. Includes one Netfinity NetBAY3 with casters.
2. Netfinity 7100 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. Tower models require Netfinity 8Ux24D Tower-to-Rack Kit P/N 37L6859 for installation in a rack.
3. Netfinity 7100 tower models require Netfinity 8Ux24D Rack-to-Tower Kit P/N 37L6860 for use with a NetBAY3. A maximum of three NetBAY3 enclosures, including the one which ships with the conversion kit, may be stacked beneath a supported Netfinity tower server. Optional NetBAY3s must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.
4. Tower models includes both a mouse and keyboard. Rack models include neither.
5. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
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. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
8. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
9. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
10. The Netfinity 7100 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. Netfinity 7100 uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. The addition of a DLT tape drive may require a fourth power supply to preserve redundancy.
9. Rack Power Cable P/N 94G7448 (type C12 - one for each Power Supply), must be ordered for power connection to a high voltage UPS or PDU.
10. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
11. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
12. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe

Netfinity 7100 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[1]	1, 2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25")HH	N	N/A	10L7440[2], 03K8756[3]
00N7990	40/80 GB DLT Internal SCSI Tape Drive[1]	1+2	16 Ultra2 LVD	133-mm (5.25") FH	N	N/A	03K8705[2] 03K8756[3]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[1]	1, 2	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[2] 03K8756[3]
	Tape Autoloaders						
00N79xx[9]	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DDS/4 Tape Autoloader[1]	1+2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[3]
	External Tape Libraries[4]						
00N79xx[10]	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[6]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[7]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[8]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator[2]	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[3]	-	16 LVD	Int.	Y	N	03K8756

Note: Netfinity 7100 includes an external 0.8-mm VHDCI connector.

1. Non-RAID Configurations require PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which contains a five-drop multi-mode terminated LVD SCSI cable. RAID configurations where the hot-swap backplane is cabled to a RAID controller, utilise the included two-drop multi-mode terminated LVD SCSI cable ito attach internal tapes to the onboard controller.
2. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
3. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
6. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
7. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
8. NetMEDIA Systems Management Adapter (P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
9. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
10. 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.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

Netfinity 7100 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 Application Server

Part Number	Description	Quantity	Usage
641YMxx	Netfinity 7100 700MHz/2 MB Xeon, 256 MB ECC, Open, 40X, PCI	1	-
33L3067	Netfinity 64 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	4	2 GB Total System Memory
10K2332	700MHz/2 MB Upgrade II with Pentium III Xeon Processor	2	Total of 3 SMP processors
37L7201	9.1 GB Wide Ultra160 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
37L7202	18.2 GB Wide Ultra160 SCSI Hot-Swap SL HDD	6[1]	72 GB RAID 5 with hot-spare
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1	RAID 1 for NOS, RAID 5 for data
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
T274Axx	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black	1	
SUP142Y	APC Smart-UPS 1400	1	UPS

1. Six HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is four HDDs or 72.8GB

This tower server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset...data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

Server Consolidation

Part Number	Description	Quantity	Usage
631YMxx	Netfinity 7100 700MHz/1 MB Xeon, 256 MB ECC, Open, 40X, PCI	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	768 MB Total System Memory
10K2331	700MHz/1 MB Upgrade II with Pentium III Xeon Processor	1	Total of 2 SMP processors
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
3L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	8[1]	109 GB RAID 5 with hot-spare
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1	RAID 1 for NOS, RAID 5 for data
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	2	Total of 3 Ethernet connections
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full Power Redundancy
T274Axx	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black	1	-
SUP142Y	APC Smart-UPS 1400	1	UPS

1. Eight HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is six HDDs or 109.2GB

This tower model is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers onto one platform there is only one system to manage, both hardware and software. There is potentially less expense for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the Netfinity 7100 is designed for high availability. This configuration includes 109 GB of internal HDD storage, features a third power supply which provides fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 80 GB per tape...in addition to all the standard features of the Netfinity 7100.

IBM Netfinity 7600 Configurator

Part Number	Withdrawal Date:ddmmyy[7]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[6]	Bays: (Tot/Av)	Slots:(T/A)
K54RYxx[1]	-	700	1/4	1024	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[5]	4/2	0/364GB	40X-17X	14/12	6/5
K55RYxx[1]	-	700	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[5]	4/2	0/364GB	40X-17X	14/12	6/5

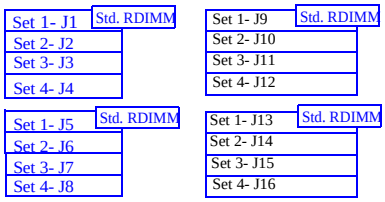
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 7600 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache and 100 MHz access to memory and I/O buses.
3. Advanced Chipkill ECC memory - corrects two-bit, three-bit, and four-bit memory errors.
4. Robust configurations may require optional Netfinity 250 W Hot-Swap Redundant Power Supply P/N 33L37xx for redundancy. See "Power" under Netfinity 7600 Power, Monitor & Accessories" for additional information.
5. RAID adapter is equivalent to ServeRAID-4M Ultra160 SCSI Controller P/N 37L6080.
6. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
7. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 7600 Processor Upgrades

Part Number	Processor Upgrades Description	SMP Support[1]	Processor Speed Upgrade[2]
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	K54RYxx	51RYxxx, 52RYxxx
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	53RYExx, K55RYxx	51RYxxx, 52RYxxx, K54RYxx

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four 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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 7600 Memory Configurator



All RDIMMs installed in each set must be the same size , but all the sets do not have to contain RDIMMs of the same size . Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]			
	128 MB (P/N 33L3113)	256 MB (P/N 33L3115)	512 MB (P/N 33L3117)	1 GB (P/N 33L3119)
512 MB	4 x 128 RDIMMs standard	-	-	-
1.0 GB	4	-	-	-
1.5 GB	-	4	-	-
2.0 GB	4	4	-	-
2.5 GB	-	8	-	-
3.0 GB	4	-	4	-
4 GB	4	4	4	-
5 GB	4	-	8	-
6 GB[3]	-	8	8	-
7 GB[3]	-	4	12	-
8 GB[3]	-	-	16	-
9 GB	4	-	-	8
10 GB[3]	-	-	12	4
12 GB[3]	-	-	8	8
14 GB[3]	-	-	4	12
16 GB (max)[3]	-	-	-	16

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. Example: For 2.0 GB, order 4 x P/N 33L3113 plus 4 x P/N 33L3115.
3. Requires removal of standard RDIMMs.

Part Number	Memory Description[1]
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Memory must be installed in sets of four identical RDIMMs (example: quantity four of P/N 33L3113). Install RDIMM sets in numerical sequence from Set 1 to Set 4. Chipkill support is provided on the memory card.

Netfinity 7600 Internal Hard Disk Drive (HDD) and External Storage Configurator

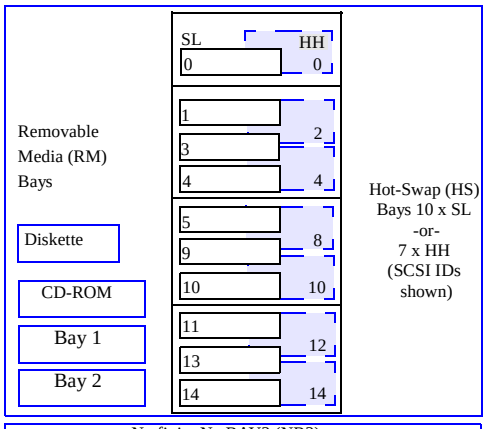
Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]	9.1 GB (P/N 19K0655)[2]	18.2 GB (P/N 19K0656)[2]
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
27.3 GB	3	-	-	3	-	-	3	-
36.4 GB	4 or	2 or	1	4 or	2 or	1	4 or	2
45.5 GB	5	-	-	5	-	-	5	-
54.6 GB	6 or	3	-	6 or	3	-	6 or	3
63.7GB	7	-	-	7	-	-	7	-
72.8 GB	8 or	4 or	2	8 or	4 or	2	8 or	4
81.9GB	9	-	-	9	-	-	9	-
91 GB	10 or	5	-	10 or	5	-	10 or	5
109.2 GB	-	6 or	3	-	6 or	3	-	6
127.4GB	-	7	-	-	7	-	-	7
145.6GB	-	8 or	4	-	8 or	4	-	8
163.8GB	-	9	-	-	9	-	-	9
182GB	-	10 or	5	-	10 or	5	-	10
218.4GB	-	-	6	-	-	6	-	-
254.8GB	-	-	7	-	-	7	-	-
291.2 GB	-	-	8	-	-	8	-	-
327.6 GB	-	-	9	-	-	9	-	-
364 GB (max)	-	-	10	-	-	10	-	-

This table does not represent all possible hard disk drive (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 ± 0.2 GB unless otherwise noted.
2. Netfinity 7600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	SL	Yes	Diskette
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
RM 1	133 mm (5.25")	HH[1]	Yes	Open
RM 2	133 mm (5.25")	HH[1]	Yes	Open
1...10 or 1...7	HS	SL or HH[2]	Yes	Open
NB3[3]	19" Rack	3U	Yes	Open

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	See diagram	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	See diagram	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	See diagram	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	See diagram	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	See diagram	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	See diagram	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. The top bay is HH; all others are configured in groups of 3 SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.
3. Tower configured systems (Netfinity 8Ux24D Rack-to-Tower Kit, P/N 37L6860 is required and includes a single NetBAY3) support installation of up to three NetBAY3s. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.



Netfinity NetBAY3 (NB3)
(Optional on Tower Configurations)

1. The top bay is HH; all others are configured in groups of three SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

	External Storage Expansion Units[2]	Form Factor
19K11xx[8]	EXP300 Storage Expansion Unit[3, 7]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
19K11xx[9]	FAStT 200 Storage Server[4, 5, 7]	Rack (3U)
19K11xx[10]	FAStT 200 HA Storage Server[4, 7]	Rack (3U)
19K1121	FAStT 200 Redundant RAID Controller[5]	-
00N71xx[11]	FAStT EXP500 Storage Expansion Unit[6, 7]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[7]	-

1. Netfinity 7600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. 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.
3. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W power supplies, each with it's own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
4. The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
5. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
6. The FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350 W power supplies, each with it's own standard country power cord.
7. These units do 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 Rack Power Cables according to the number of power supplies.
8.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.
9.Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
10. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
11. Where 'xx' represents a country specific 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. Country/Language Line Cords/Publications are included as indicated.

4.

Internal SCSI Cabling

The Netfinity 7600 contains a DASD backplane supporting ten hot-swap, SCA-2 compliant drive bays. The backplane is connected to the internal connector of the standard Netfinity ServeRAID Adapter through a 16-bit LVD SCSI cable. External RAID support is provided through the two external 0.8-mm VHDCI connectors on the back of the adapter. To support SCSI devices in the internal 133/89-mm (5.25/3.5-inch) half-high bays, a two-drop, 16-bit LVD SCSI cable with integrated terminator is included with the server. This cable can be used to connect Channel B of the integrated Wide Ultra2 SCSI controller to SCSI devices in one or both of the removable media bays. Channel A, of the dual-channel, Wide Ultra2 SCSI controller, only supports external SCSI attachment and is cabled directly to an external 0.8-mm VHDCI SCSI connector.

Netfinity 7600 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	SCSI Storage Controllers[3]						
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	3...6	-	5	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...6[4]	X	Universal	33
37L6091	ServeRAID-4L Ultra160 SCSI Controller[6]	Full	32/64-bit	1...6[4]	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1...6[4]	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[8]	Half	32/64-bit	1...6	-	Universal	66
	Fibre Storage Controller[9]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...6	X	Universal	66
	Networking[10]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...6[4]	X	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...6[4]	X	Universal	33
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...6[4]	X	Universal	33
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...6[4]	X	Universal	33
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...6	X	Universal	66
	Token Ring						
34L5001	16/4 Token-Ring PCI Management Adapter[11]	Half	32-bit	1...6[4]	X	Universal	33
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[11]	Half	32-bit	1...6[4]	X	Universal	33
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter[11]	Half	32-bit	1...6[4]	X	Universal	33
	Communications[12]						
37L14xx	Serial I/O SST 8, 16, and 128 port adapters[13]	Half	32-bit	3...6[13]	-	5	33
	Systems Management[14]						
36L96xx[21]	Netfinity Advanced System Management PCI Adapter[15, 16]	Full	32-bit	3...6[16]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[17]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[18]	-	-	-	-	-	-
	Host Attach						
10L7368	Netfinity ESCON Adapter[19, 20]	Full	32-bit	3...6[20]	-	5	33

1.The 5 V slots support Universal or 5 V adapters. The 3.3 V slots support universal or 3.3 V adapters. A Universal keyed 66 MHz adapter plugged into a 33 MHz slot will operate at 33 MHz. A Universal keyed 33 MHz adapter plugged into a 66 MHz slot limits other adapters installed on the same bus to 33 MHz.
2. Slots 3-6 include hot-plug capability using IBM's Active PCI technology.
3. Models P/N 51RYExx, 52RYExx and 53RYExx include a single ServeRAID-3HB Ultra2 SCSI controller as standard. Models P/N K54RYxx and K55RYxx include a single ServeRAID-4M Ultra160 controller. One channel of these adapters is attached to the internal hot-swap backplane. Remaining channels are available for external usage just as the option would be. All models include a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller with one internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI).
4. Installation of a 33 MHz adapter into a Bus B 66 MHz slot will slow operation of all Bus B slots to 33 MHz.
5. Netfinity ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
6. Netfinity ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI.
7. Netfinity ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
8. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
9. See Fibre Array Solutions section for additional configuration information.
10. Netfinity 7600 includes a full-duplex, 10/100 Mbps Ethernet PCI Controller.
11. The Wake on LAN function of this option is not supported by this server.
12. Netfinity 7600 includes two USB ports, two high-speed serial/asynchronous ports (NS16550A compatible), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
13. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
14. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 7600 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter P/N 36L96xx and Netfinity Advanced System Management Interconnect Cable Kit P/N 03K9309 additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
15. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection P/N 36L9654.
16. A maximum quantity of one is supported.
17. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1...4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
18. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter, and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware access URL www.pc.ibm.com/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable files", and finally "Advanced Systems Management".
19. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
20. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
21. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.

Netfinity 7600 Power, Monitors, Accessories

Part Number	Description
Power[1,9]	
33L37xx[10]	250 W Hot-Swap Redundant Power Supply[9]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[9]
Uninterruptable Power Supply (UPS)[2]	
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
14RIxxx[12]	APC Smart-UPS 1400RMB[3]
30RIxxx[12]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
Monitors[5]	
T3347xx[11]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
T31U2xx[11]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
T32U3xx[11]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black[6]
T274Axx[11]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black[6]
11AG1xx[11]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black[7]

Part Number	Description
Conversion Kits	
37L6860	8Ux24D Rack-to-Tower Kit[1]
Rack and NetBAY[2,10]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated door)
9306200	Netfinity NetBAY22
10L6912	Netfinity NetBAY3[3]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[10]
Keyboard and Mouse[4]	
28L36xx[8]	Space Saver II Keyboard[5, 7]
28L36xx[9]	Preferred Keyboard (stealth black)[6]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Netfinity 7600 includes three 250W hot-swap redundant power supplies, with the ability to accept one additional 250 W Hot-Swap Redundant Power Supply P/N 33L37xx. To assist in determining when an additional power supply is required to preserve redundancy, a “Non-Redundant LED” is a standard feature of the Netfinity 7600. Predicting whether or not a particular configuration will require an additional power supply for redundancy is very complex. However, once the system is installed, the“Non-Redundant LED” will indicate when an additional power supply is required. The following sample configuration is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Typical Redundant Configuration
	4 x Processors
3[8]	6 x PCI Adapters
	7 x Half-High or 10 Slim-Line HDDs
	16 x 512 MB RDIMMs
4	**Full Configuration with Redundancy**

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See “Rack and NetBAY” for supported IBM racks.
4. Height is 5U. See “Rack and NetBAY” for supported IBM racks.
5. Netfinity 7600 uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. The addition of a DLT tape drive may require a 4th power supply to preserve redundancy.
9. Rack Power Cable P/N 94G7448 (type C12 - one for each Power Supply), must be ordered for power connection to a high voltage UPS or PDU.
10. Where ‘xx’ refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
11. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
12. Where ‘xxx’ represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

1. Includes one Netfinity NetBAY3 with casters.
2. Netfinity 7600 rack models are housed in a 19” rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
3. Netfinity 7600 requires 8Ux24D Rack-to-Tower Kit (P/N 37L6860) for use with a NetBAY3. A maximum of three NetBAY3 enclosures, including the one which ships with the conversion kit, may be stacked beneath a supported Netfinity tower server. Optional NetBAY3s must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.
4. Netfinity 7600 ships without a keyboard or mouse.
5. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in “ready-to-use” position).
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. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
8. Where ‘xx’ represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19L3834=Belgium, 19K3836=Russia, 19K3837=Poland.
9. Where ‘xx’ represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
10. The Netfinity 7600 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

Netfinity 7600 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1, 2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	10L7440[2], 03K8756[1]
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1+2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8705[2], 03K8756[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	1, 2	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[2], 03K8756[1]
	Tape Autoloaders						
00N79xx[8]	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DOS/4 Tape Autoloader	1+2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[1]
	External Tape Libraries[3]						
00N79xx[9]	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[4]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[5]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[1]	-	16 LVD	Int.	Y	N	03K8756

Note: Netfinity 7600 includes a two-drop multimode terminated LVD SCSI cable, an available internal Ultra2 SCSI port and an external Ultra2 0.8-mm VHDCI connector.

1. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
2. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
6. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
7. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
8. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
9. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

Netfinity 7600 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 Application Server

Part Number	Description	Quantity	Usage
53RYExx	Netfinity 7600 700MHz/2MB Xeon, 512MB(R) ECC,RAID, Open, 40X, PCI	1	-
33L3113	Netfinity 128MB, 100MHz ECC SDRAM RDIMM	4	-
33L3115	Netfinity 256MB, 100MHz ECC SDRAM RDIMM	4	-
33L3117	Netfinity 512MB, 100MHz ECC SDRAM RDIMM	4	4 GB Total System Memory
10K2332	700 MHz/2MB Upgrade II with Pentium III Xeon Processor	3	Total of 4 SMP processors
37L7201	9.1GB Wide Ultra160 SCSI Hot-Swap SL HDD	2	9.1GB mirrored for NOS
37L7202	18.2GB Wide Ultra160 SCSI Hot-Swap SL HDD	6[1]	72GB RAID 5 with Hot-Spare
00N7990	40/80GB DLT Internal SCSI Tape Drive	1	-
33L37xx	250W Hot-Swap Redundant Power Supply	1	Full Power Redundancy
T274Axx	G78 Color Monitor 17” (454mm, 17.9” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver II Keyboard	1	-
14RIxxx	APC Smart-UPS 1400RMB	1	-
External Storage			
19K11xx	EXP300 Storage Expansion Unit	1	Includes 2M Ultra2 cable
37L7206	Netfinity 36.4GB 10K-4 Wide Ultra160 SCSI Hot-Swap SL HDD	14	RAID 5 Data Storage with Hot-Spare
Rack			
9306200	Netfinity NetBAY22	1	
09N4290	NetBAY 1x4 Console Switch	1	
94G7448	Power Cable - Type C12	1	
94G7447	NetBay Console Cable Set 12ft	1	
94G6670	Blank Filler Panel Kit	1	

1. Six HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is four HDDs or 72.8GB

This rack server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset...data. A modem could be included to allow out-of-band (non-LAN) system management utilising the integrated Netfinity Advanced System Management Processor.

Server Consolidation

Part Number	Description	Quantity	Usage
54RYExx	Netfinity 7600 700MHz/1MB Xeon, 512MB(R) ECC, RAID, Open, 40X, PCI	1	-
33L3113	Netfinity 128MB, 100MHz ECC SDRAM RDIMM	4	1GB Total System Memory
10K2331	700 MHz/1MB Upgrade II with Pentium III Xeon Processor	1	Total of 2 SMP processors
37L7204	9.1GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2	9.1GB mirrored for NOS
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	8[1]	109GB RAID 5 with Hot-Spare
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	3	Total of 4 Ethernet connections
00N7990	40/80GB DLT Internal SCSI Tape Drive	1	-
T274Axx	G78 Color Monitor 17” (454mm, 17.9” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver II Keyboard	1	-
14RIxxx	APC Smart-UPS 1400RMB	1	-
Rack			
9306200	Netfinity NetBAY22	1	-
09N4290	NetBAY 1x4 Console Switch	1	-
94G7448	Power Cable - Type C12	1	Attaches to monitor
94G7447	NetBay Console Cable Set 12ft	1	-
94G6670	Blank Filler Panel Kit	2	-

1. Eight HDDs are used for RAID 5 protection. One HDD is identified as a hot-spare. Effective storage capacity is six HDDs or 109.2GB

This rack server is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers on to one platform there is only one system to manage, both hardware and software. There is potentially less expense for service, software licenses, etc., and there is less concern about single points of failure because the Netfinity 7600 is designed for high availability. This configuration includes 109 GB of internal HDD storage, features three power supplies which provide fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up as much as 80GB per tape--in addition to all the standard features of the Netfinity 7600.

IBM Netfinity 8500R Configurator

Part Number	Withdrawal Date: ddmmyy[5]	Processor Speed (MHz)[2]	Number of Proc.(Std./Max)	L2 ECC Cache (KB)	Memory (Std/Max)R=RDIMM	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap(Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor[3]	Onboard Ethernet	SCSI Controller(Dual, Ultra2, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk (Std./Max)	CD-ROM(IDE)[4]	Bays (Total/Avail)	Slots (T/A)
17RYNxx[1]	-	700	1/8	1024	512 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
18RYNxx[1]	-	700	1/8	2048	512 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12

1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 8500R Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor.
3. Netfinity 8500R includes a systems management adapter equivalent to the one shipped with Netfinity Advanced System Management PCI Adapter P/N 36L96xx (Advanced System Management PCI Adapter).
4. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
5. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 8500R Processor Upgrades

Part Number	Processor Upgrades Description[1]	SMP Support[2]	Processor Speed/Cache Upgrade[3]
33L5104	Netfinity 8500R 550 MHz/1 MB Upgrade with Pentium III Xeon Processor	15RYxxx	14RYxxx
33L5105	Netfinity 8500R 550 MHz, 2 MB Upgrade with Pentium III Xeon Processor	16RYxxx	14RYxxx, 155RYxxx
28L4730	Netfinity 8500R>4-Way Enablement Kit (1X SRAM)[5]	14RYxxx to 16RYxxx[4]	14RYxxx to 16RYxxx
28L4727	Netfinity 8500R>4-Way Enablement Kit (4X SRAM)[5]	14RYxxx to 16RYxxx[4]	14RYxxx to 16RYxxx
10K2330	Netfinity 8500R 700 MHz/1 MB Upgrade with Pentium III Xeon Processor[3]	17RYxxx	14RYxxx to 16RYxxx[5]
10K2166	Netfinity 8500R 700 MHz, 2 MB Upgrade with Pentium III Xeon Processor[3]	18RYxxx	14RYxxx to 17RYxxx[5]
10K2335	Netfinity 4X Accelerator Filter	17RYxxx to 18RYxxx[4]	14RYxxx to 17RYxxx
10K2337	Netfinity Mezzanine Expansion Kit	17RYxxx to 18RYxxx[4]	14RYxxx to 17RYxxx

1. Netfinity 8500R architecture optimises memory and bus performance using a 100 MHz, five-port crossbar core chipset. Up to eight Pentium III Xeon processors are supported on two 100 MHz P-6 CPU buses. The recommended order of processor installation is: Sockets A1, A3, A2, A4, B1, B3, B2, B4.
2. Up to seven additional processors may be installed, providing a maximum of eight. All processors must be identical in type, speed, and cache size.
3. Requires removal of the standard processor(s). A maximum of eight processors may be installed. Installation of greater than four processors requires the addition of a mezzanine board and two cache coherency filters. Required options which provide the board and filters vary by model. For more information refer to "Processor Upgrade Requirements". 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.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
4. See "Processor Upgrade Requirements" to determine when this option is required.
5. Replacement of the standard processor mezzanine board and the mezzanine board from any installed enablement kit of 550 MHz models is required. See "Processor Upgrade Requirements" to determine specific model upgrade requirements.

	Processor Upgrade Requirements[1,2]			
	Upgrade To			
Upgrade From	≤ 4 x 550 MHz processors	> 4 x 550 MHz processors	≤ 4 x 700 MHz processors	> 4 x 700 MHz processors
≤ 4 x 550 MHz processors	-	1 x 28L4730 or 1 x 28L4727	1 x 10K2337[3]	1 x 10K2335, 2 x 10K2337[3]
> 4 x 550 MHz processors	n/a	-	1 x 10K2337[3, 4]	2 x 10K2337[3, 5]
≤ 4 x 700 MHz processors	n/a	n/a	-	1 x 10K2335, 1 x 10K2337

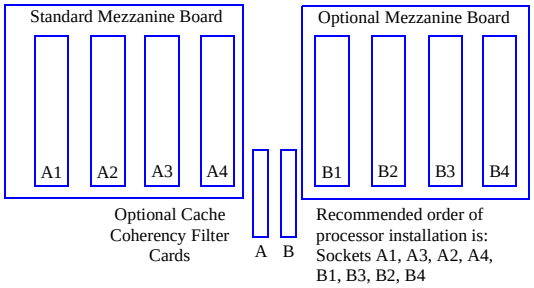
1. This table does not address the processor part numbers required. It does address the optional Enablement Kit, Filters, and Mezzanine Board part numbers required.
2. All processors must be identical in type, speed, and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS".
3. Remove the standard processor mezzanine board.
4. Remove all optional Enablement Kit components.
5. Remove Enablement Kit mezzanine board. The Enablement Kit 4X cache coherency filters are supported for use with Netfinity Mezzanine Expansion Kit P/N 10K2337.

Netfinity 8500R ships with a single mezzanine board containing four Pentium III Xeon processor sockets with terminators in the unoccupied sockets. An additional mezzanine board may be added, expanding the number of processor sockets to eight. The two mezzanine boards are then linked through two cache coherency filter cards, one for each mezzanine board.

Option Content

Netfinity 8500R > 4-Way Enablement Kits (P/N 28L4730 and P/N 28L4727)

- Support for 550 MHz models only
- Required for installation of processors 5...8.
- One Processor Mezzanine Board
- Two cache coherency filter modules
  - 28L4730 economical 1X (256 K entries)
  - 28L4727 high performance 4X (1 M entries)
  - Filters may be used with Mezzanine Expansion Kit (P/N 10K2337)



Optional Cache Coherency Filter Cards

Recommended order of processor installation is: Sockets A1, A3, A2, A4, B1, B3, B2, B4

Netfinity 4X Accelerator Filter (P/N 10K2335)

- Two cache coherency filter modules
- Requires Mezzanine Kit 10K2337

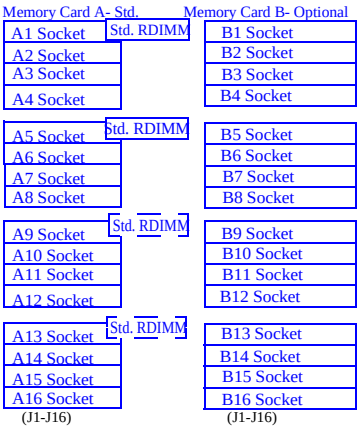
Netfinity Mezzanine Expansion Kit (P/N 10K2337)

- One Processor Mezzanine Board
- Supports cache coherency filters from the following options:
  - P/N 10K2335
  - P/N 28L4730
  - P/N 28L4727
- Supports 700 MHz and above processors only
- Required when upgrading models 8681-4RY...6RY to 700 MHz or above

All installed processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine “Type-Model” in Quick Path. Select “Downloadable files” then “BIOS”.

Netfinity 8500R Memory Configurator

Total System Memory[1]		Quantity of RDIMMs Added			
Standard Models					
256 MB (2 x 128)	512 MB (4 x 128)	128 MB (P/N 20L0245)	256 MB (P/N 20L0247)	512 MB (P/N 20L0249)	1 GB (P/N 33L3056)
384	640	1	-	-	-
512	768	2 or	1	-	-
768	1024	4 or	2 or	1	-
1024	1280	6 or	3	-	-
1280	1536	8 or	4 or	2 or	1
1536	1792	10 or	5	-	-
1792	2048	12 or	6 or	3	-
2304	2560	16[2] or	8 or	4 or	2
2560	2816	18[2] or	9	-	-
2816	3072	20[2] or	10 or	5	-
3072	3328	22[2] or	11	-	-
3328	3584	24[2] or	12 or	6 or	3
3840	4096	28[2] or	14[4] or	7	-
4096	-	30[2] or	16[3]	-	-
4352	4608	-	16[2] or	8 or	4
4864	5120	-	18[2] or	9	-
5376	5632	-	20[2] or	10 or	5
5888	6144	-	22[2] or	11	-
6400	6656	-	24[2] or	12 or	6
7424	7680	-	28[2] or	14[4] or	7
8192	8192	-	32[2, 3] or	16[3]or	8[3]
8448	8704	-	-	16[2] or	8
9472	9728	-	-	18[2] or	9
10496	10752	-	-	20[2] or	10
11520	11776	-	-	22[2] or	11
12544	12800	-	-	24[2] or	12
13568	13824	-	-	26[2] or	13
14592	14848	-	-	28[2] or	14[4]
15488	15488	-	-	-	15[6]
16384	16384	-	-	32[2, 3] or	16[3]
16640	16896	-	-	-	16[2]
18688	18944	-	-	-	18[2]
20736	20992	-	-	-	20[2]
22784	23040	-	-	-	22[2]
24832	25088	-	-	-	24[2]
26880	27136	-	-	-	26[2]
28928	29184	-	-	-	28[2]
30720	30720	-	-	-	30[5]
32768	32768	-	-	-	32[3]



Recommended order of RDIMM population for optimum cooling: 1, 5, 9, 13, 3, 7, 11, 15, 2, 6, 10, 14, 4, 8, 12, 16.

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.

NOTE: Cache line interleaving may be enabled by installing Netfinity 8500R Memory Expansion Card P/N 28L4454 with as few as two RDIMMs. Matched pairs must be installed if the memory expansion card is present.

1. Network Operating Systems may limit the maximum amount of addressable memory. See the operating system specifications for further information.
2. Netfinity 8500R Memory Expansion Card (P/N 28L4454) is required for installation of greater than 16 RDIMMs.
3. Requires removal of standard memory.
4. Models with 4 x 128 RDIMMs standard require Netfinity 8500R Memory Expansion Card (P/N 28L4454) for installation of greater than 16 RDIMMs.
5. Requires removal of all but two of the standard RDIMMs.
6. Requires removal of all but one of the standard RDIMMs.

Part Number	Memory Description[1]
20L0245	Netfinity 128 MB SDRAM ECC RDIMM II
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II
20L0249	Netfinity 512 MB SDRAM ECC RDIMM II
28L4454	Netfinity 8500R Memory Expansion Card[2]
33L3056	Netfinity 1 GB SDRAM ECC RDIMM II

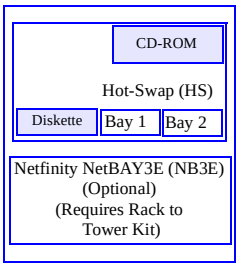
1. Netfinity 8500R includes a single memory card with the ability to support up to 16 GB of memory. Model P/N 14RYNxx contains two RDIMMs standard, other models contain four. For memory installation of greater than 16 GB, Netfinity 8500R Memory Expansion Card (P/N 28L4454) is required. Installation of memory on systems containing a single memory card (standard on all models) has no restrictions on size or placement. When Netfinity 8500R Memory Expansion Card (P/N 28L4454) is installed, the memory RDIMM in each socket of Card A must match the RDIMM in the same socket on Card B. To enable cache line interleaving, both memory cards must be installed and configured identically.
2. Required for enablement of cache line interleaving or installation of greater than 16 RDIMMs. Configuration of the standard memory card (Card A) and optional P/N 28L4454 (Card B) must be identical.

Total Internal Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]	9.1 GB (P/N 19K0655)[2]	18.2 GB (P/N 19K0656)[2]
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
9.1 GB	1	-	-	1	-	-	1	-
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
36.4 GB	-	2 or	1	-	2 or	1	-	2
72.8 GB (max)	-	-	2	-	-	2	-	-

This table does not represent all possible hard disk drive (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 ± 0.2 GB unless otherwise noted.
2. Netfinity 8500R contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
-	89 mm (3.5")	SL	Yes	Diskette
1...2	HS	HH	Yes	Open
NB3E[1]	19" Rack	3U	Yes	Open

1. A total of three optional 3U NetBAY3Es can be stacked beneath a Netfinity 8500R which has Netfinity 8Ux28D Rack-to-Tower Kit (P/N 28L4705) installed. See IBM Netfinity NetBAY3x Stackable Enclosure section for supported devices.



Part Number	Description	RPM	Height	Bays Supported	Max Qty.
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1, 2	2
37L7202	18.2 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1, 2	2
37L7203	36.4 GB Ultra160 SCSI Hot-Swap HDD	7200	SL	1, 2	2
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1, 2	2
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	10,000	SL	1, 2	2
37L7206	36.4 GB 10-K Ultra160 SCSI Hot-Swap HDD	10,000	SL	1, 2	2
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1, 2	2
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1, 2	2
	External Storage Expansion Units[2]	**Form Factor**			
19K11xx[8]	EXP300 Storage Expansion Unit[3, 7]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
19K11xx[9]	FAStT 200 Storage Server[4, 5, 7]	Rack (3U)			
19K11xx[10]	FAStT 200 HA Storage Server[4, 7]	Rack (3U)			
19K1121	FAStT 200 Redundant RAID Controller[5]	-			
00N71xx[11]	FAStT EXP500 Storage Expansion Unit[6, 7]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[7]	-			

1. Netfinity 8500R contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. 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.
3. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with it's own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
4. The FAStT200 Storage Server and HA Storage Server each include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
5. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
6. The FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350 W power supplies, each with it's own standard country power cord.
7. These units do 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 Rack Power Cables according to the number of power supplies.
8. 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.
9. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
10. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
11. Where 'xx' represents a country specific 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. Country/ Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

Netfinity 8500R systems contains an LVDS backplane supporting two hot-swap drive bays that support installation of up to two 3.5-inch, slim-high or half-high HDDs. The backplane is connected to the internal Wide Ultra2 SCSI controller through a 16-bit LVD SCSI cable. RAID support for the internal hot-swap drive bays is provided by adding a supported RAID adapter and moving the standard SCSI cable from the onboard controller to the optional RAID controller. The standard external Wide Ultra2 SCSI port uses a 0.8-mm Very High Density Connector Interface (VHDCI).

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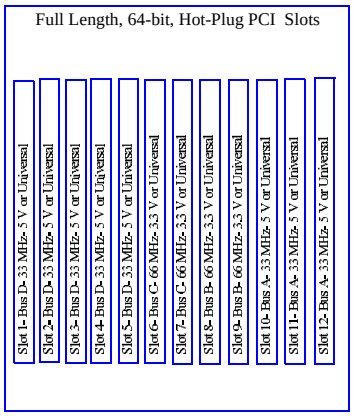
Netfinity 8500R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	SCSI Storage Controllers[3]						
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...12[4]	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1...12[4]	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[7]	Half	32/64-bit	1...12	-	Universal	66
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5, 10...12	-	5	33
	Fibre Storage Controller[8]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...12	X	Universal	66
	Networking[9]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...12[4]	X	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...12[4]	X	Universal	33
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...12[4]	X	Universal	33
06P3601	10/100 Ethernet Server Adapter	Half	32-bit	1...12[4]	X	Universal	33
06P3701	Gigabit Ethernet SX Server Adapter (fibre optic cabling interface)	Half	32/64-bit	1...12	X	Universal	66
	Token Ring						
34L5001	16/4 Token-Ring PCI Management Adapter[10]	Half	32-bit	1...12[4]	X	Universal	33
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[10]	Half	32-bit	1...12[4]	X	Universal	33
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter[10]	Half	32-bit	1...12[4]	X	Universal	33
	Communications[11]						
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[12]	Half	32-bit	1...5, 10...12[12]	-	5	33
	Systems Management[13]						
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[14]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[15]	-	-	-	-	-	-
02K65xx[19]	UltraSlim 56W AC Adapter[16]	-	-	-	-	-	-
	Host Attach						
10L7368	Netfinity ESCON Adapter[17, 18]	Full	32-bit	(1...5, 10...12)[18]	-	5	33

1. The P-6 I/O bus supports four independent 64-bit PCI buses, two of which drive eight 33 MHz, 5.0 V slots (1-5, 10-12), while the other two buses drive four 66 MHz, 3.3 V slots (6-9). The 5 V slots support Universal or 5 V adapters. A 66 MHz adapter plugged into these slots will operate at 33 MHz. The 3.3 V slots support Universal or 3.3 V adapters. A 33 MHz adapter plugged into these slots limits a 66 MHz PCI adapter installed on the same bus to 33 MHz.
2. All 12 Slots are hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat.
3. Netfinity 8500R includes a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller which supports either Single Ended (SE) or Low Voltage Differential SCSI (LVDS) modes. One internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI) are standard. The internal LVD SCSI cable has sufficient length to attach to an adapter located in slots 10...12. If a boot device (internal or external) is to be attached to an adapter, the adapter must reside in slots 10...12 due to BIOS scanning sequences.
4. Installation of a 33 MHz adapter into a Bus B or C 66 MHz slot will slow operation of all Bus B or C slots to 33 MHz.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI.
6. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
7. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
8. See Fibre Channel Solutions section for additional configuration information.
9. Netfinity 8500R does not include an onboard network controller.
10. The Wake on LAN function of this option is not supported by this server.
11. Netfinity 8500R includes two USB ports, two high-speed serial/asynchronous ports, (NS 16550A compatible), and one high-speed (up to 2 MBps data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
12. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (in any combination) may be installed.
13. Netfinity 8500R ships standard with a Netfinity Advanced System Management PCI Adapter.
14. Required for all Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft). A customer-supplied Ethernet cable is required for each interconnection.
15. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware, access URL www.ibm.com/pc/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable Files" and finally "Advanced System Management".
16. Although the 8500R integrated Netfinity Advanced System Management PCI Adapter is powered continuously through the redundant power supply subsystem, an even higher level of availability is offered with the addition of UltraSlim 56W AC Adapter by allowing an independent power source or connection to a separate optional UPS.
17. Provides an ESCON MIC and DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
18. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single Netfinity server. Where possible, install in a minimally loaded bus.
19. Where 'xx' represents a country specific code: 84=Denmark, 89=Israel, 88=Italy, 85=South Africa/India, 87=Switzerland, 86=UK, 83=EU1.



Netfinity 8500R Power, Monitors, Accessories

Part Number	Description
	Power[1]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[8]
	Uninterruptible Power Supply (UPS)[2]
30RIxxx[10]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
	Monitors[5]
T3347xx[9]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
T31U2xx[9]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
T32U3xx[9]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black[7]

1.Netfinity 8500R systems contain three 750 W (at 220 V), hot-swap power supplies which handle robust configurations while providing full redundancy. Even though multiple UPSs may provide redundant power sources, systems management software does not currently take advantage of its power outage alerts.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimates.
3. Height is 3U. See “Rack and NetBAY” for supported IBM racks.
4. Height is 5U. See “Rack and NetBAY” for supported IBM racks.
5. Netfinity 8500R uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. Rack Power Cable P/N 94G7448 (type C12 - one for each Power Supply), must be ordered for power connection to a high voltage UPS or PDU.
9. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where ‘xxx’ represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
	Conversion Kits
28L4705	8Ux28D Rack-to-Tower Kit[1]
	Rack and NetBAY[2,12]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack[3]
9306910	Netfinity Rack[3] (includes perforated front door)
36L9703	Netfinity Rack Extension Kit[3]
9306200	Netfinity NetBAY22[4]
36L9702	NetBAY22 Rack Extension Kit[4]
36L9701	Netfinity NetBAY3E[5]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[12]
	Keyboard and Mouse[6]
28L36xx[10]	Space Saver Keyboard[7, 8]
28L36xx[11]	Preferred Keyboard (stealth black)[9]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Includes one Netfinity NetBAY3E with casters.
2. Netfinity 8500R is housed in a 19” rack mountable drawer and requires one of the racks listed here. See “IBM Netfinity Rack Cabinet and Options” section for IBM rack supported devices.
3. Netfinity Rack Extension Kit P/N 36L9703 is required for proper rear door closure clearance.
4. NetBAY22 Rack Extension Kit P/N 36L9702 is required for proper rear door closure clearance.
5. A maximum of three NetBAY3E enclosures may be stacked beneath a supported Netfinity tower server (conversion kit P/N 28L4705 required). See IBM Netfinity NetBAY3X Stackable Enclosure section for supported devices.
6.Netfinity 8500R ships without a keyboard or mouse.
7. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in “ready-to-use” position).
8. Advanced TrackPoint IV features are not available on IBM Netfinity sy.stems.
9. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
10. Where ‘xx’ represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
11. Where ‘xx’ represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
12. The Netfinity 8500R ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered.

Netfinity 8500R Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Encl.
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	N	N/A	10L7440[2] 03K8756[1]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A	8	133 mm (5.25") FH	N	Y	03K8705[2], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A	16 Ultra2 LVD	133 mm (5.25") FH‘	N	N/A	03K8705[2], 03K8756[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[2], 03K8756[1]
Tape Autoloaders							
00N79xx[8]	DLT Tape Autoloader	-	16	Desktop	Y	N/A	-
00N7992	120/240GB DDS/4 Tape Autoloader	N/A	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[1]
External Tape Libraries[3]							
00N79xx[9]	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
External Tape Enclosures							
10L7440	External Half High SCSI Storage Enclosure[4]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[5]	-	16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	03K8756
Associated Options							
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[1]	-	16 LVD	Int.	Y	N	03K8756

Note: Netfinity 8500R does not support internal tape drives but does include an external Ultra2 0.8-mm VHDCI SCSI connector for attachment of an external tape or tape enclosure. All tape drives and enclosures are also supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and controller then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable

1. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode LVD-SCSI terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
2. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
6. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a Rack Cabinet P/N 930842X.
7. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
8. Where ‘xx’ represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
9. 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.

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

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM ServerProven compatibility pages on the Web at URL http://www.ibm.com/pc/us/compat

Netfinity 8500R Sample Configurations

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-Rack

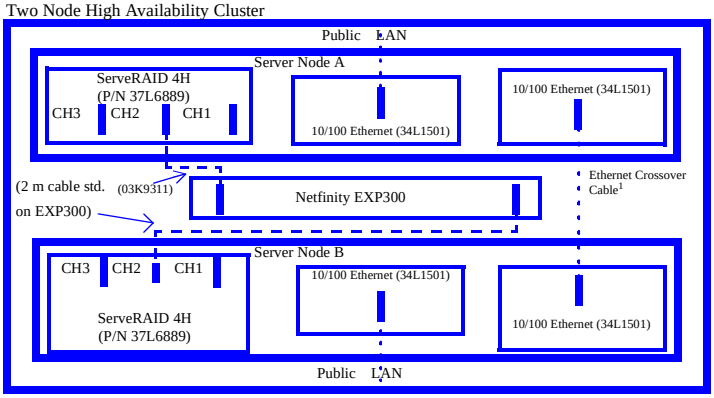
Part Number	Description	Quantity	Usage
18RYNxx	Netfinity 8500R 700MHz/2MB, 512MB, Open	1	Power Redundancy standard
10K2166	700 MHz/2MB Upgrade with Pentium III Xeon Processor	5	Total of 6 SMP processors
10K2335	Netfinity 4X Accelerator Filter	1	Required for greater than 4 processors in this model
10K2337	Netfinity Mezzanine Expansion Kit	1	Required for greater than 4 processors in this model
20L0247	Netfinity 256MB SDRAM ECC RDIMM II	8	Total of over 2GB of memory
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	2	NOS mirroring
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	RAID Controller - NOS plus EXP300
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	1	-
T31U2xx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver Keyboard	1	-
37L6862	APC Smart-UPS 5000RMiB	1	-
External Storage			
03K8756	NetMEDIA Storage Expansion Unit EL	1	External Tape Drive Enclosure
00N7990	40/80 B DLT Internal SCSI Tape Drive	2	Installs in NetMEDIA Enclosure
19K11xx	Netfinity EXP300 Storage Expansion Unit	1	Provides additional 10 bays
03K9310	Netfinity 2M Ultra2 SCSI Cable	1	Tape Enclosure to Onboard SCSI
37L7204	9.1GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	6	RAID 5 with Hot-Spare in EXP300
Rack Options			
9306200	Netfinity NetBAY22	1	Monitor and keyboard mount on top
36L9702	NetBAY22 Rack Extension Kit	1	Required for rear door closure
94G7448	Power Cable - Type C12	5	-
94G6670	Blank Filler Panel Kit	1	-

This high availability server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. The configuration includes enough disk drives to mirror the operating system and provide a RAID 5 data environment, power supply redundancy by the server and EXP300 and a UPS for power even during a blackout. A rack mounted tape drive is included to back up that all important asset...data. This server represents the leading edge in high availability.

Notes/Exchange-Stack

Part Number	Description	Quantity	Usage
17RYNxx	Netfinity 8500R 700MHz/1MB, 512MB, Open	1	Power redundancy standard
10K2330	700MHz/1MB Upgrade with Pentium III Xeon Processor	5	Total of 6 SMP processors
10K2335	Netfinity 4x Accelerator Filter	1	Required for greater than 4 processors
10K2337	Netfinity Mezzanine Expansion Kit	1	Required for greater than 4 processors
20L0249	Netfinity 512MB SDRAM ECC RDIMM II	3	Total of 2GB of memory
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	2	NOS Mirroring
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	2	-
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	RAID Controller - NOS plus EXP300
T31U2xx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver Keyboard	1	-
37L6862	APC Smart-UPS 5000RMiB	1	-
External Storage			
03K8756	NetMEDIA Storage Expansion Unit EL	1	External Tape Enclosure - Install in NetBAY3E
00N7990	40/80GB DLT Internal SCSI Tape Drive	2	Installs in NetMEDIA Enclosure
03K9310	Netfinity 2M Ultra2 SCSI Cable	1	Tape Enclosure to Onboard SCSI
19K11xx	Netfinity EXP300 Storage Expansion Unit	1	Provides additional 14 Bays, 1 x 2M cable
3L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	14	RAID 5 with Hot-Spare in EXP300
Stack Options			
28L4705	8Ux28D Rack-to-Tower Kit	1	-
36L9701	Netfinity NetBAY3E	3	3 x 3U enclosure for UPS, EXP300, Tape

Two Node High Availability Cluster



1.Customer supplied Ethernet Crossover Cable may vary in length up to a maximum of 25 feet (7.6 m).

Two Node High Availability Cluster

Part Number	Description	Quantity	Usage
	Server Nodes A & B		
18RYNxx	Netfinity 8500R 700MHz/2 MB, 512MB, Open	2	Power redundancy standard
10K2166	700MHz/2MB Upgrade with Pentium III Xeon Processor	10	Total of 6 SMP processors per node
10K2335	Netfinity 4X Accelerator Filter	2	Required for greater than 4 processors
10K2337	Netfinity Mezzanine Expansion Kit	2	Required for greater than 4 processors
20L0247	Netfinity 256MB SDRAM ECC RDIMM II	16	Total of over 2GB of memory per node
28L4454	Netfinity 8500R Memory Expansion Card	2	Enables cache line interleaving
34L1501	Netfinity 10/100 Ethernet Adapter 2[1]	4	1 for crossover, 1 for public LAN/node
37L6889	ServeRAID-4H Ultra160 SCSI Controller[2]	2	RAID controller - NOS plus EXP300
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	4	NOS mirroring
37L6862	APC Smart-UPS 5000RMiB	2	-
	External Storage		
03K8756	NetMEDIA Storage Expansion Unit EL (3U)	1	External Tape Drive Enclosure
03K9311	Netfinity 4.2M Ultra2 SCSI Cable[3]	1	Tape Enclosure to onboard SCSI
00N7990	40/80GB DLT Internal SCSI Tape Drive	1	Installs in NetMEDIA Enclosure
19K11xx	Netfinity EXP300 Storage Expansion Unit (3U)[2]	1	Provides additional 14 bays
03K9311	Netfinity 4.2M Ultra2 SCSI Cable[2, 3]	2	SRAID to EXP300
37L7204	9.1GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	14	RAID 5 shared storage in EXP300
	Shared (or single occurrence) Resources		
11AG1xx	T54A Flat Panel Color Monitor (15.0" Viewable Image Size), stealth black	1	Mounts in keyboard tray
28L36xx	Space Saver Keyboard	1	-
	Rack Options		
930842P	Netfinity Enterprise Rack	1	-
37L6888	Netfinity Flat Panel Monitor Rack-Mount Kit (3U)	1	Mounts in keyboard tray
28L4707	Netfinity Rack Keyboard Tray	1	-
28L0542	Netfinity Console Server Selector Switch (4-port)	1	-
94G7448	Power Cable-Type C12	4	-
94G7447	NetBay Console Cable Set 12ft	2	-
94G6670	Blank Filler Panel Kit	1	-

1. Requires customer supplied Ethernet Crossover Cable which may vary in length up to a maximum of 25 feet (7.6 m).
2. By replicating these items, up to a total quantity of four ServeRAID-4H Adapters (plus options) and eleven EXP300s can provide over 2 Terabytes of storage. Additional power and rack space will be required.
3. Cable length requirements are dependent on component placement within the rack or rack suite. To determine specific configuration requirements use the Netfinity Rack and/or Spreadsheet Configurators which can be downloaded from Web site **www.ibm.com/pc/europe/configurators**

Clustering is a group of interconnected computers used as a single, unified computing resource. Clustering Netfinity servers, like the IBM Netfinity 8500R, provides a high availability solution to keep you in touch with the key applications you need to run your business.

This sample configuration consists of paired IBM Netfinity 8500R cluster nodes equipped with eight-way SMP capability and redundant power supplies. Microsoft Cluster Service (MSCS) has been validated on IBM Netfinity 8500R servers, using the Netfinity ServeRAID-4H with the EXP300 Storage Expansion Unit. MSCS allows two configured servers, referred to as nodes, to be connected together to form a cluster. Providing system redundancy means that a complete server can fail and client access to server resources is largely unaffected. MSCS extends this theme by also allowing for software failures at an application level as well as an operating system level. If the operating system fails, all applications and services can be restarted on another server, and if just one application fails, it can be managed by MSCS individually. An additional independent network connection is used to perform monitoring within the cluster. One or more disk subsystems are attached to both nodes. In the above example, a Netfinity EXP300 was selected and the Netfinity ServeRAID-4H Ultra2 SCSI Adapters provide the I/O control. Netfinity ServeRAID-4H handles the "SCSI heartbeat" connection without the need for a dedicated SCSI connection and logically attaches the quorum disk, which allows arbitration when a failure occurs. Additional information on IBM Netfinity and IBM PC Server Clustering Solutions may be found on the World Wide Web by accessing URL **www.ibm.com/pc/ww/eserver/xseries/clustering/index.html**

IBM EXP300 Configurator

EXP300 Hard Disk Drive (HDD) Configurator

Total Int. Storage[1]	7200 RPM Ultra160 SCSI HDDs			10,000 RPM Ultra160 SCSI HDDs			15,000 RPM Ultra160 SCSI HDDs	
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)	9.1 GB (P/N 19K0655)	18.2 GB (P/N 19K0656)
0 GB	0GB Standard on Base Models			0GB Standard on Base Models			0GB Standard on Base Models	
18.2 GB	2 or	1	-	2 or	1	-	2 or	1
36.4 GB	4 or	2 or	1	4 or	2 or	1	4 or	2
54.6 GB	6 or	3	-	6 or	3	-	6 or	3
72.8 GB	8 or	4 or	2	8 or	4 or	2	8 or	4
91 GB	10 or	5	-	10 or	5	-	10 or	5
109.2 GB	12 or	6 or	3	12 or	6 or	3	12 or	6
127.4 GB	14 or	7 or	-	14 or	7 or	-	14 or	7
145.6GB	-	8 or	4	-	8 or	4	-	8
182 GB	-	10 or	5	-	10 or	5	-	10
218.4 GB	-	12 or	6	-	12 or	6	-	12
254.8 GB	-	14 or	7	-	14 or	7	-	14
291.2 GB	-	-	8	-	-	8	-	-
364.0 GB	-	-	10	-	-	10	-	-
436.8 GB	-	-	12	-	-	12	-	-
509.6 GB (max.)	-	-	14	-	-	14	-	-

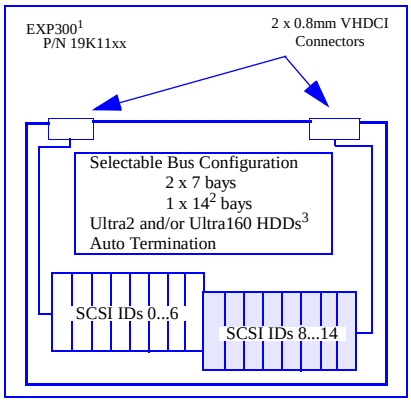
This table does not represent all possible hard disk drive (HDD) configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the HDD of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.

SCSI ID	Form Factor	Height	Front Access	Usage
0...6	HS	SL	Yes	open
8...14	HS	SL	Yes	open

	Maximum MB/s	
Cable Length (Meters	Ultra2 Controller	Ultra160 Controller
2	80	160
4.2	80	160

1. The EXP300 ships with a single Ultra2 SCSI cable similar to Netfinity 2M Ultra2 SCSI Cable (P/N 03K9310).

Part Number	Description	RPM	Height	Bays Supported[1]	Max. Qty.
	Ultra 160 Hard Disk Drives (HDD)[2]	**RPM**	**Height**	**Bays Supported**	
37L7201	9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1...14	14[3]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...14	14[3]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...14	14[3]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...14	14[3]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...14	14[3]



1. Housed in a 19" rack mountable drawer and ships standard with redundant 500 W 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 Netfinity Enterprise Rack (930842P) or Expansion Cabinet (930842X), Rack (9306900), NetBAY22 (9306200), NetBAY3 (10L6912), NetBAY3E (36L9701) or Rack-to-Tower Conversion Kit (09N7296).

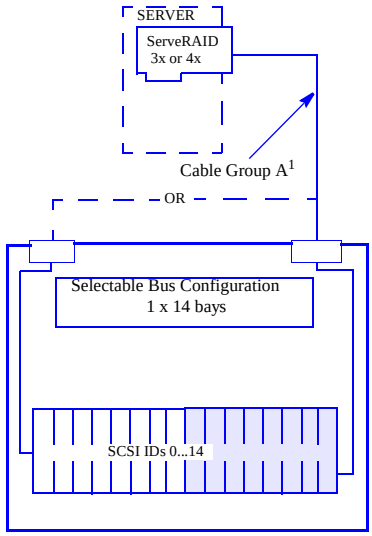
External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage Units-Controllers.

	External Storage Expansion Unit	Form Factor
19K11xx[6]	EXP300 Storage Expansion Unit[4, 5]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
94G7448	Rack Power Cable Type C12 (3.7m)[5]	-

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. 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.
3.Twintailing reduces the maximum number of HDDs on a single bus to 13.
4. The EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with it's own standard country power cord.
5. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). A standard country power cord only is included. If required, order one Rack Power Cable for each power supply.
6. 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.

Cables and Controllers:
See Appendix D: Cables - Storage Units - Controllers

EXP300 One Independent SCSI Bus

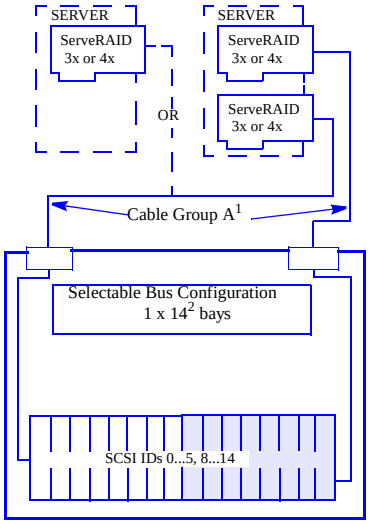


Order:
- 1 x P/N 19K11xx
- 1 x External Cable from Group A[1]
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2 M 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[2] bays.

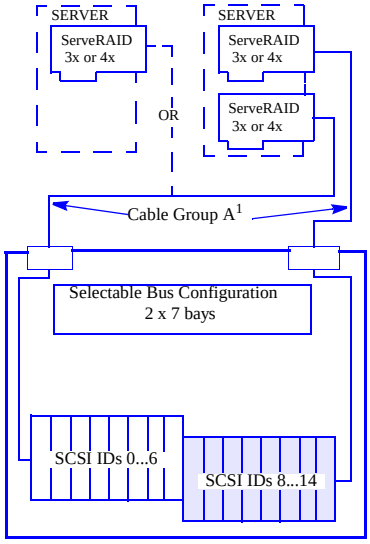


Order:
- 1 x P/N 19K11xx
- 2 x External Cables from Group A[1]
- Up to 13 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable droup 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 7 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 P/N 19K11xx
- 2 x External Cables from Group A[1]
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable droup A.

IBM FAStT200 (HA) Configurator

FAStT200 Storage Server - Hard Disk Drive (HDD) Configurator

Total Internal Storage[1]	10,000 RPM Fibre Channel HDDs			15,000 RPM Fibre Channel HDD
	18.2 GB (P/N 19K0652)	36.4 GB (P/N 19K0653)	73.4 GB (P/N 19K0654)	18.2 GB (P/N 06P5707)
0 GB	0GB Standard on Base Models			0GB Standard on Base Models
18.2 GB	1	-	-	1
36.4 GB	2 or	1	-	2
54.6 GB	3	-	-	3
72.8 GB	4 or	2	-	4
73.4 GB	-	-	1	-
91.0 GB	5	-	-	5
109.2 GB	6 or	3	-	6
145.6 GB	8 or	4	-	8
146.8 GB	-	-	2	-
182.0 GB	10 or	5	-	10
218.4 GB	-	6	-	-
220.2 GB	-	-	3	-
254.8 GB	-	7	-	-
291.2 GB	-	8	-	-
293.6 GB	-	-	4	-
327.6 GB	-	9	-	-
364.0 GB	-	10	-	-
367.0 GB	-	-	5	-
440.4 GB	-	-	6	-
513.8 GB	-	-	7	-
587.2GB	-	-	8	-
660.6 GB	-	-	9	-
734.0 GB (max)	-	-	10	-

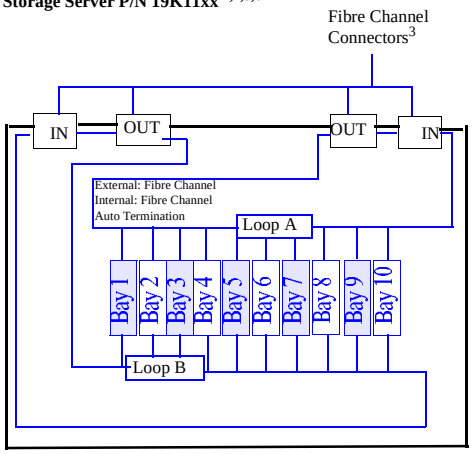
This table does not represent all valid hard disk drive (HDD) configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the HDD of choice. Total Internal Storage listed is within +- 0.2 GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty Supported
19K0652	18.2 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0653	36.4 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0654	73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1...10	10
06P5707	18.2 GB 15K-rpm FC Hot-Swap HDD	15,000	SL	1...10	10

External Storage Expansion Unit		Form Factor
19K11xx[4]	FAStT200 Storage Server[1,2,3]	Rack (3U)
19K11xx[5]	FAStT200 HA Storage Server[1,3]	Rack (3U)
19K1121	FAStT200 Redundant RAID Controller[2]	-
94G7448	Rack Power Cable Type C12 (3.7m)[3]	-

1. The FAStT200 Storage Server and HA Storage Server include two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
2. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller P/N 19K1121.
3. These units do 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.
4. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated
5. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.

IBM FAStT200 Storage Server P/N 19K11xx [1,2,4,6]
IBM FAStT200 HA Storage Server P/N 19K11xx [1,2,5,6]



1. Housed in a 19" Rack mountable drawer and ships standard with redundant power supplies and two standard country power cables requiring separate power sources. Requires IBM industry standard 19" rack, EIA-310D, with a minimum depth of 24" (711.2 mm) or NetBAY3/3E.

Note: The FAStT200 Storage Server and HA Storage Server do not ship with a storage controller or external cables. Select these items from the Fibre Channel Device Ports Reference Chart in the Fibre Array Solutions section.

2. The FAStT200 Storage Server includes a single loop only. The second loop (shown in the diagram) is available with the addition of a FAStT200 Redundant RAID Controller P/N 19K1121. This configuration then becomes equivalent to the FAStT200 HA Storage Server.
3. GBICs are not included. Either Fibre Channel Long or Short-Wave GBICs (P/N 03K9307 or 03K9308 respectively) may be used.
4. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
5. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
6. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). A standard country power cord only is included. If required, order one Rack Power Cable for each power supply.

IBM FAStT EXP500 Configurator

FAStT EXP500 Storage Expansion Unit - Hard Disk Drive (HDD) Configurator

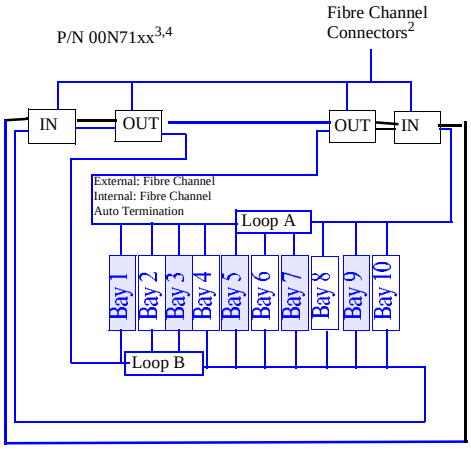
Total Internal Storage[1]	10,000 RPM Fibre Channel HDDs			15,000 RPM Fibre Channel HDD
	18.2 GB (P/N 19K0652)	36.4 GB (P/N 19K0653)	73.4 GB (P/N 19K0654)	18.2 GB (P/N 06P5707)
0 GB	0GB Standard on Base Model			0GB Standard on Base Models
18.2 GB	1	-	-	1
36.4 GB	2 or	1	-	2
54.6 GB	3	-	-	3
72.8 GB	4 or	2	-	4
73.4 GB	-	-	1	-
91.0 GB	5	-	-	5
109.2 GB	6 or	3	-	6
145.6 GB	8 or	4	-	8
146.8 GB	-	-	2	-
182.0 GB	10 or	5	-	10
218.4 GB	-	6	-	-
220.2 GB	-	-	3	-
254.8 GB	-	7	-	-
291.2 GB	-	8	-	-
293.6 GB	-	-	4	-
327.6 GB	-	9	-	-
364.0 GB	-	10	-	-
367.0 GB	-	-	5	-
440.4 GB	-	-	6	-
513.8 GB	-	-	7	-
587.2GB	-	-	8	-
660.6 GB	-	-	9	-
734.0 GB (max)	-	-	10	-

This table does not represent all valid hard disk drive (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 +- 0.2 GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty Supported
19K0652	18.2 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0653	36.4 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0654	73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1...10	10
06P5707	18.2 GB 15K-rpm FC Hot-Swap HDD	15,000	SL	1...10	10
External Storage Expansion Unit		**Form Factor**			
00N71xx[3]	FAStT EXP500 Storage Expansion Unit[1,2]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m)[2]	-			

1. The FAStT EXP500 Storage Expansion Unit includes two hot-swap, 350 W auto-ranging redundant power supplies each with it's own standard country power cord.
2. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cord only are included. If required, order one Rack Power Cable for each power supply.
3. Where 'xx' represents a country specific 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. Country/Language Line Cords/Publications are included as indicated.

IBM FAStT EXP500 Storage Expansion Unit[1]



1. Housed in a 19" Rack mountable drawer and ships standard with redundant power supplies and two standard country power cables requiring separate power sources. Requires IBM industry standard 19" rack, EIA-310D, with a minimum depth of 24" (711.2 mm) or NetBAY3/3E.

Note: **Note**: The FAStT EXP500 External Enclosure does not ship with a storage controller or external cables. Select these items from the Fibre Channel Device Ports Reference Chart in the Fibre Array Solutions section.

2. GBICs are not included. Either Fibre Channel Long or Short-Wave GBICs (P/N 03K9307 or 03K9308 respectively) may be used.
3. Where 'xx' represents a country specific 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. Country/Language Line Cords/Publications are included as indicated.
4. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU).

Fibre Array Solutions

Fibre Interconnection Guidelines

Part Number	Description	00N6881 FAStT Host Adapter	00N6882 FAStT Mini Hub[1]	01K7296 FC Failsafe RAID Controller	19K1121 FastT200 Redun. Raid Controller[1]	2108R3S SAN Data Gateway Router (SE)[1]	2109S08 SAN FC Switch, 8-Port[1]	2109S16 SAN FC Switch, 16-Port[1]	SFCU1xx[3] FC RAID Controller Unit	35L1647 SAN FC Managed Hub[1]	19K11xx[5] FASTT200 Storage Server[1]	19K11xx[6] FASTT200 HA Storage Server[1]	00N69xx[2] FASTT500 Storage Server[1]	00N71xx[4] FASTT EXP500[1]
00N6881	FAStT Host Adapter	-	-	S	S	S	S	S	S	S	S	S	S	-
00N6882	FAStT500 Mini Hub	-	E	-	E	-	E	E	-	-	-	-	H	E
01K7296	FC Failsafe RAID Controller[7]	-	-	-	-	-	S	S	H	S	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	S	-	-	-	-	E	E	-	E	H	-	-	-
2108R3S	SAN Data Gateway Router (single-ended)	S	-	-	-	-	S	S	-	S	-	-	-	-
2109S08	SAN FC Switch, 8-Port	S	E	S	E	S	E	E	E	-	E	E	E	E
2109S16	SAN FC Switch, 16-Port	S	E	S	E	S	E	E	E	-	E	E	E	E
SFCU1xx[2]	FC RAID Controller Unit[8]	S	-	H	-	-	S	S	-	-	-	-	-	-
35L1647	SAN FC Managed Hub	S	E	S	E	S	-	-	E	E	E	E	E	-
19K11xx[3]	FAStT200 Storage Server	S	-	-	H	-	E	E	-	E	-	-	-	E
19K11xx[4]	FAStT200 HA Storage Server	S	-	-	-	-	E	E	-	E	-	-	-	E
00N69xx[5]	FAStT500 Storage Server[8]	-	H	-	-	-	E	E	-	E	-	-	-	E
00N71xx[6]	FAStT EXP500 Storage Expansion Unit	-	E	-	E	-	-	-	-	-	E	E	E	E
03K9307	FC Long-Wave GBIC	-	H	-	H	-	H	H	H	H	H	H	H	H
03K9308	FC Short-Wave GBIC	-	H	-	H	-	H	H	H	H	H	H	H	H

S Short-wave connection only. See Fibre Device Ports Reference section for GBIC/Integrated port information.
L Long-wave connection only. See Fibre Device Ports Reference section for GBIC/Integrated port information
E Either Short-wave or Long-wave connections allowed. See Fibre Device Ports Reference section for GBIC/Integrated port information.
H Hardware connection. One of these devices installs directly into the other. i.e.: The FAStT500 Mini Hub (P/N 00N6882) installs directly into the FAStT500 Storage Server (P/N 00N69xx) 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/Integrated port information.
2. Where 'xx' = country publication and power cord codes as follows:- UK=United Kingdom and Arabia, DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, SE=Switzerland/English, EU=countries not covered previously.
3. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
4. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
5. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
6. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
7. Fibre Channel Failsafe RAID Controller P/N 01K7296 was withdrawn with effect from 27/02/01.
8. Fibre Channel RAID Controller Unit P/N SFCU1xx was withdrawn with effect from 31/01/01 - and is replaced by FAStT500 Storage Server P/N 00N69xx.

Fibre Device Ports Reference

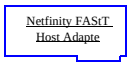
Part Number	Description	Total Connections Possible	Integrated Ports[3]	Mini Hubs Possible	Mini Hubs Installed	GBIC Ports	GBICs Included[3]
00N6881	FAStT Host Adapter	1	1	-	-	-	-
00N6882	FAStT500 Mini Hub[1]	2	-	-	-	2	-
01K7296	FC Failsafe RAID Controller[10]	1	1	-	-	-	-
03K9307	FC Long-Wave GBIC	1	-	-	-	-	-
03K9308	FC Short-Wave GBIC	1	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	2	-	-	-	2	-
2108R3S	SAN Data Gateway Router[2]	1	1	-	-	-	-
2109S08	SAN FC Switch, 8-Port	8	-	-	-	8	4
2109S16	SAN FC Switch, 16-Port	16	-	-	-	16	4
SFCU1xx[5]	FC RAID Controller Unit[11]	1	1	-	-	-	-
35L1647	SAN FC Managed Hub	8	7	-	-	1	-
19K11xx[6]	FAStT200 Storage Server	2	-	-	-	2	-
19K11xx[7]	FAStT200 HA Storage Server	4	-	-	-	4	-
00N69xx[8]	FAStT500 Storage Server[11]	16[4]	-	8	4	16[1]	-
00N71xx[9]	FAStT EXP500 Storage Expansion Unit	4	-	-	-	4	-

1. Each FAStT500 Mini Hub provides two GBIC ports.
2. Single-ended SCSI.
3. Included GBICs and integrated optical ports are short-wave.
4. FAStT500 Storage Server supports up to eight non-redundant or four redundant host connections and up to eight non-redundant or four redundant storage connections.
5. Where 'xx' = country publication and power cord codes as follows:- UK=United Kingdom and Arabia, DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, SE=Switzerland/English, EU=countries not covered previously.
6. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
7. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
8. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
9. Where 'xx' represents a country specific 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. Country/Language - Line Cords/Publications are included as indicated.
10. Fibre Channel Failsafe RAID Controller P/N 01K7296 was withdrawn with effect from 27/02/01.
11. Fibre Channel RAID Controller Unit P/N SFCU1xx was withdrawn with effect from 31/01/01 - and is replaced by FAStT500 Storage Server P/N 00N69xx.

Supported Cable Groups	
Cable Group A (0.8 mm to 0.8 mm)	
03K9310	Netfinity 2 M Ultra2 SCSI Cable
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable
37L7101	Netfinity 20 M Ultra2 SCSI Cable
Cable Group D (Short-Wave Fibre)	
36L9973	Netfinity Fibre Channel 1 M Cable
03K9306	Netfinity Fibre Channel 5 M Cable
03K9305	Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)	
Cable Group E (Long-Wave Fibre)	
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)	
GBIC	
03K9308	Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307	Netfinity Fibre Channel Long-Wave GBIC

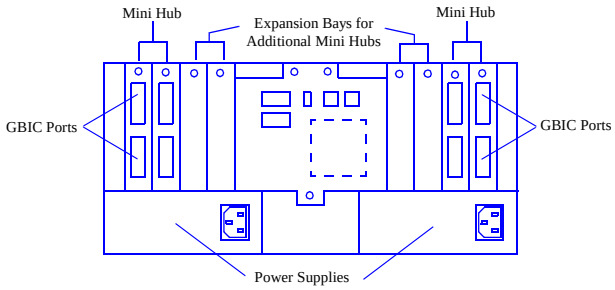
1. Four Netfinity Fibre Channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Switches (P/Ns 2109S08 and 2109S16).

FAStT Host Adapter
P/N 00N6881



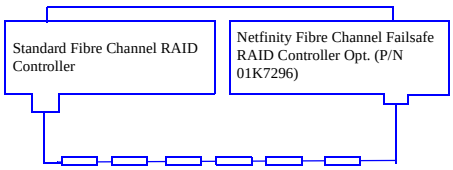
• PCI to FCAL 64/32-bit host adapter.
• Supported Attachments (use cable group D):
FAStT500 Storage Server
• Integrated short-wave optical port. No GBICs required.
•Full Fibre Channel Fabric support.

FAStT500 Storage Server
P/N 00N69xx[1]



• Dual high-performance, RAID controller cards-supports up to 100 MB/sec data transfer rate per controller.
• Two 175 W auto-ranging, hot-swap, redundant power supplies.
• Attach directly to FAStT Host Adapter(s) (P/N 00N6881) with shortwave cables and GBICs or indirectly through SAN Fibre Channel Managed Hub (P/N 35L1647) using cables from cable group D or E with corresponding GBICs.
• Height is 4U (1 U = 1.75 in. or 44.45 mm)
• Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
• For optimum performance no more than two FAStT500 Storage Servers (P/N 00N69xx) should be attached to a single hub (P/N 35L1647)
• Includes four FAStT500 Mini Hubs (P/N 00N6882), two for host and two for storage.
• FAStT500 256 MB Cache (P/N 00N6883) expansion is required in installations where a large number of devices are supported.
• All connections to FAStT500 Mini Hubs require the use of GBICs. GBICs not included.

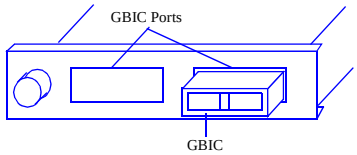
Fibre Channel RAID Controller Unit
P/N SFCU1xx[1]



1. Fibre Channel RAID Controller Unit P/N SFCU1xx was withdrawn with effect from 31/01/01 and is replaced by FAStT500 Storage Server P/N 00N69xx.

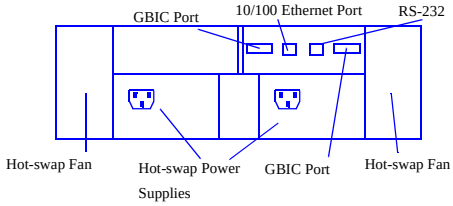
• Contains a single integrated short-wave optical port (use cable group D) and six female 0.8 mm Very High Density Connection Interface (VHDCI) SCSI connectors
• Hot-Swap Redundant Fans and Power Supplies
• Optional Netfinity Fibre Channel Failsafe RAID Controller (P/N 01K7296) provides a redundant RAID controller and second Short-Wave Fibre Connection (use cable group D)
• Attach directly to FAStT Host Adapter(s) (P/N 00N6881) or indirectly through SAN Fibre Channel Managed Hub (P/N 35L1647) using cables from cable group D.
• Height is 4 U (1 U=1.75 in. or 44.45 mm)
• Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
• For optimum performance no more than two RAID controller units P/N SFCU1xx

FAStT500 Mini Hub
P/N 00N6882



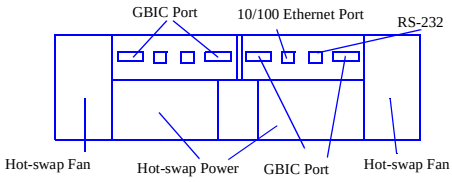
• Provides additional connections to the Netfinity FAStT500 Storage Server - supports complex clustering or advanced storage applications.
• All connections to FAStT500 Mini Hubs require the use of GBICs. GBICs are not included.

FAStT200 Storage Server P/N 19K11xx



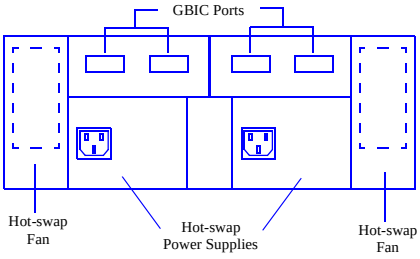
• Contains a single hot-plug, RAID controller which provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
• Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller (P/N 19K1121).
• Integrated 10/100 Mbps Ethernet connector and RS-232 service support port.
• Performance optimised for 30 disk drives - supports optional FAStT EXP500 Storage Expansion Units (P/N 00N71xx).
• Two hot-swap 350 W 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 hard disk drives.
• Height is 3U (1U= 1.75 in or 44.45 mm.
•Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D industry standard rack. Mounting rails are included with the controller.
• Support long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

FAStT200 HA Storage Server P/N 19K11xx



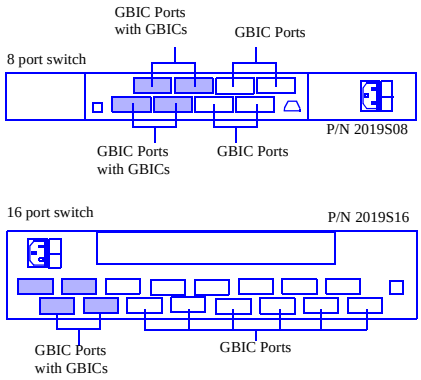
• Contains two hot-plug, RAID controllers. Each controller provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
• Integrated 10/100 Mbps Ethernet connector and RS-232 service support port.
• Performance optimised for 30 disk drives- supports optional FAStT EXP500 Storage Expansion Units (P/N 00N71xx).
• Two hot-swap 350 W 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 hard disk drives.
• Height is 3U (1U= 1.75 in or 44.45 mm.
•Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D industry standard rack. Mounting rails are included with the controller.
• Support long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

FAStT EXP500 Storage Expansion Unit P/N 00N71xx



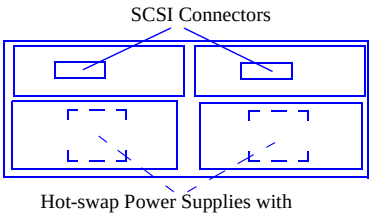
- Two hot-swap, 350 W auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
- Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
- Height is 3U (1 U = 1,75 in. or 44.45 mm)
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
- Requires optional GBICs for each connection. GBICs not included.

SAN Fibre Channel Switch, 8 or 16 Ports P/Ns 2109S08, 2109S16



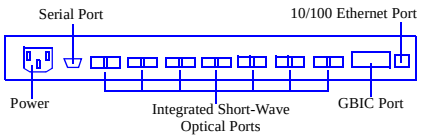
- Each port delivers up to 100 MB/sec, full-duplex data transfer.
- Comes with 4 Short-Wave GBICs installed.
- Embedded Web browser configuration, management and service.
- Support for Public Fibre Channel Arbitrated Loops.
- Optional power supply (P/N 09L5403) available.
- The 8 port switch is 1 U (1 U=1.75 in. or 44.45 mm) high and the 16 port switch is 2 U (1 U=1.75 in. or 44,45 mm) high.

EXP300 Storage Expansion Unit P/N 19K11xx



- Fourteen slim-high drive bays.
- Supports Ultra160 SCSI data transfer speeds - up to 160 MB/s.
- Single or dual SCSI bus configurations.
- Dual hot-swap 500 W redundant power supplies with integrated fan assemblies.
- Height is 3 U (1 U=1.75 in. or 44.45 mm).
- Tower capability through optional Rack-to-Tower Conversion Kit.
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.

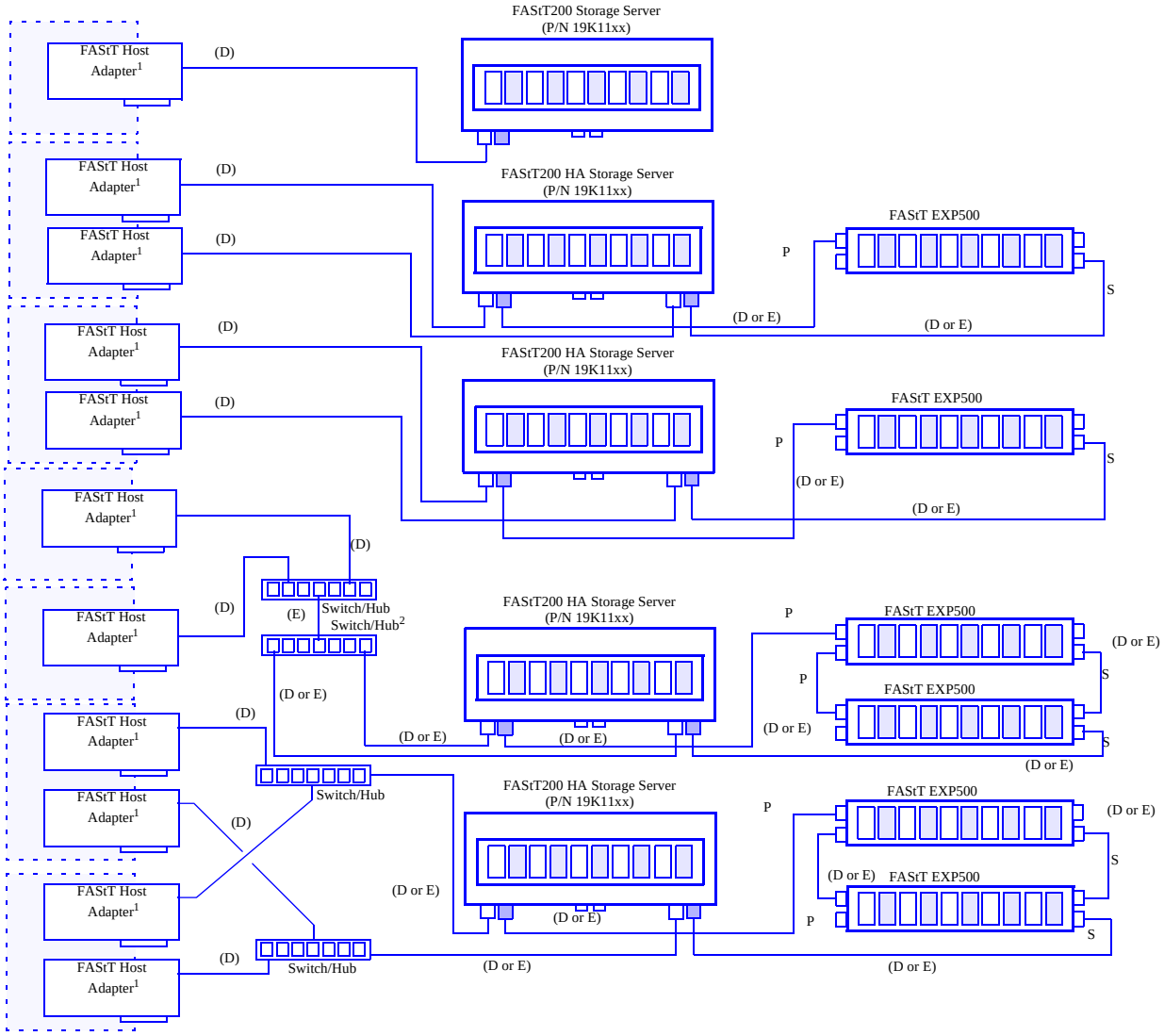
SAN Fibre Channel Managed Hub P/N 35L1647



- High-speed performance utilising nonblocking switch-based technology.
- Simultaneous 100 MB/sec full duplex data transfers across all ports.
- Eight ports total, one that is configurable with either an optional short-wave or long-wave GBIC and seven integrated short-wave optical ports.
- Support for industry standard MIBs enabling standard SNMP management.
- Height is 1 U (1 U=1.75 in. or 44.45 mm) high.

Fibre / Fibre Configuration Examples (FAStT200)

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. FAStT 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 30 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 FAStT200 Storage Server and FAStT EXP500 storage connections. GBICs are not depicted in these diagrams.
•Other Fibre Channel devices may not require optional GBICs. For specific requirements, see the Fibre Device Ports Reference.

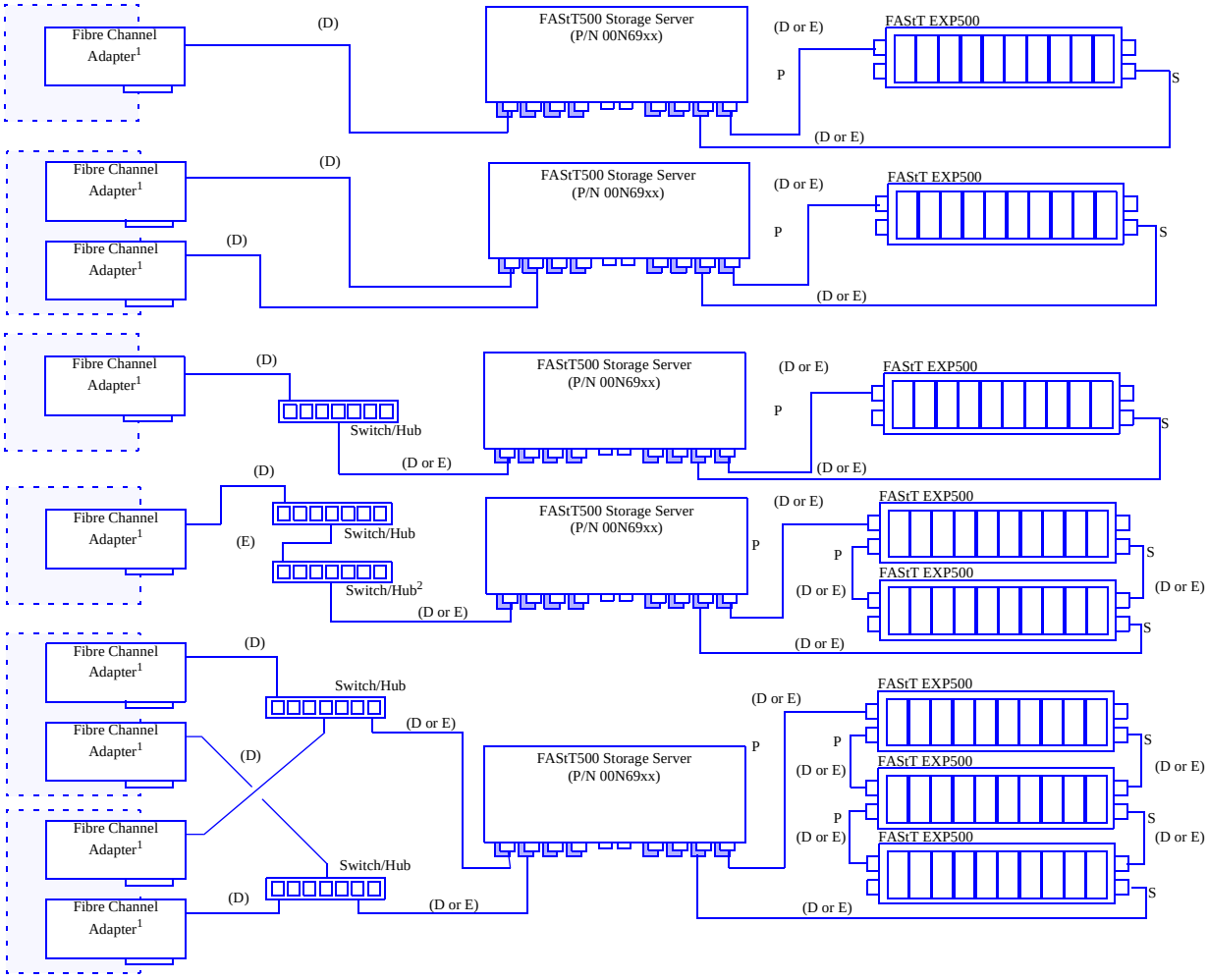
Cable Group D (short-wave Fibre Channel)
03K9306 - Netfinity Fibre Channel 5M Cable
03K9305 - Netfinity Fibre Channel 25M Cable
Customer supplied short-wave cable of up to 500M (0.31 miles)

Cable Group E (long-wave Fibre Channel)
Customer supplied long-wave cable of up to 10KM 6.2 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

Fibre / Fibre Configuration Examples (FAStT500)

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. FAStT 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.
• 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 FAStT500 Storage Server and FAStT EXP500 storage connections. GBICs are not depicted in these diagrams.
•Other Fibre Channel devices may not require optional GBICs. For specific requirements, see the Fibre Device Ports Reference.

Cable Group D (Short-Wave Fibre)
03K9306 - Netfinity Fibre Channel 5M Cable
03K9305 - Netfinity Fibre Channel 25M Cable
Customer supplied short-wave cable of up to 500M (0.31 miles)

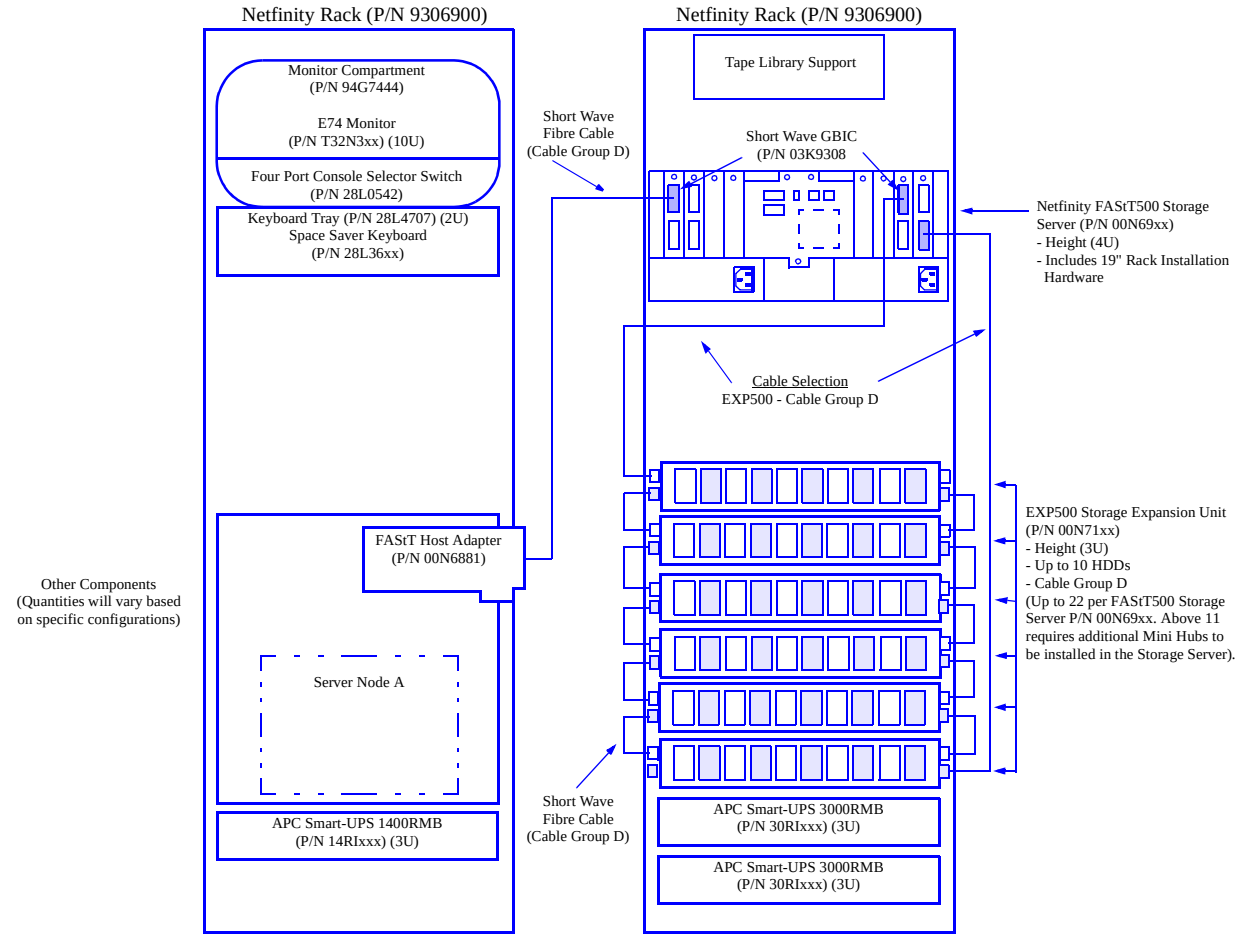
Cable Group E (long-wave Fibre Channel)
Customer supplied long-wave cable of up to 10KM
(6.2 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

IBM Netfinity Fibre Array Solutions

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-speed single-node Netfinity Fibre Channel Storage configuration offering performance, bandwidth & capacity



Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101- Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

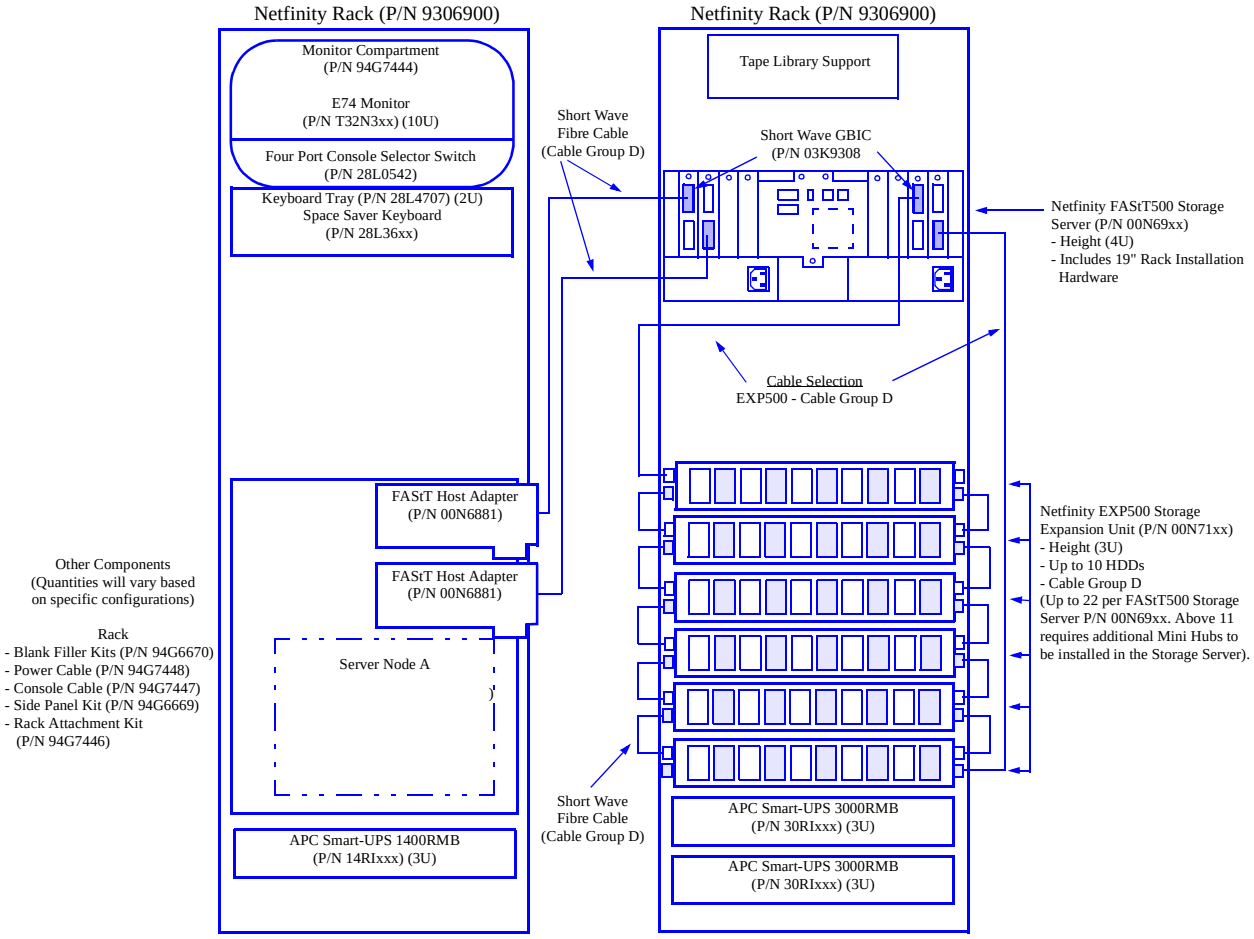
Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

IBM Netfinity Fibre Array Solutions

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-speed single-node Netfinity Fibre Channel Storage configuration with Microsoft NT failover support and RAID redundancy for availability, performance, capacity



Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
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Cable Group D (Short-Wave Fibre)
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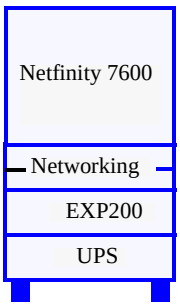
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

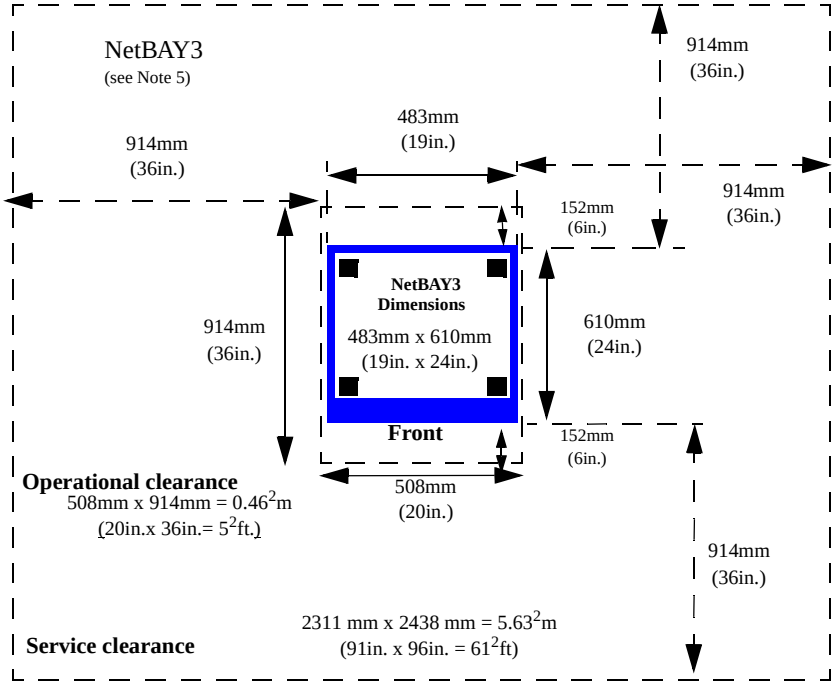
IBM Netfinity NetBAY3/NetBAY3E™ Stackable Enclosures

Sample Configuration[4]



Installation Guidelines:

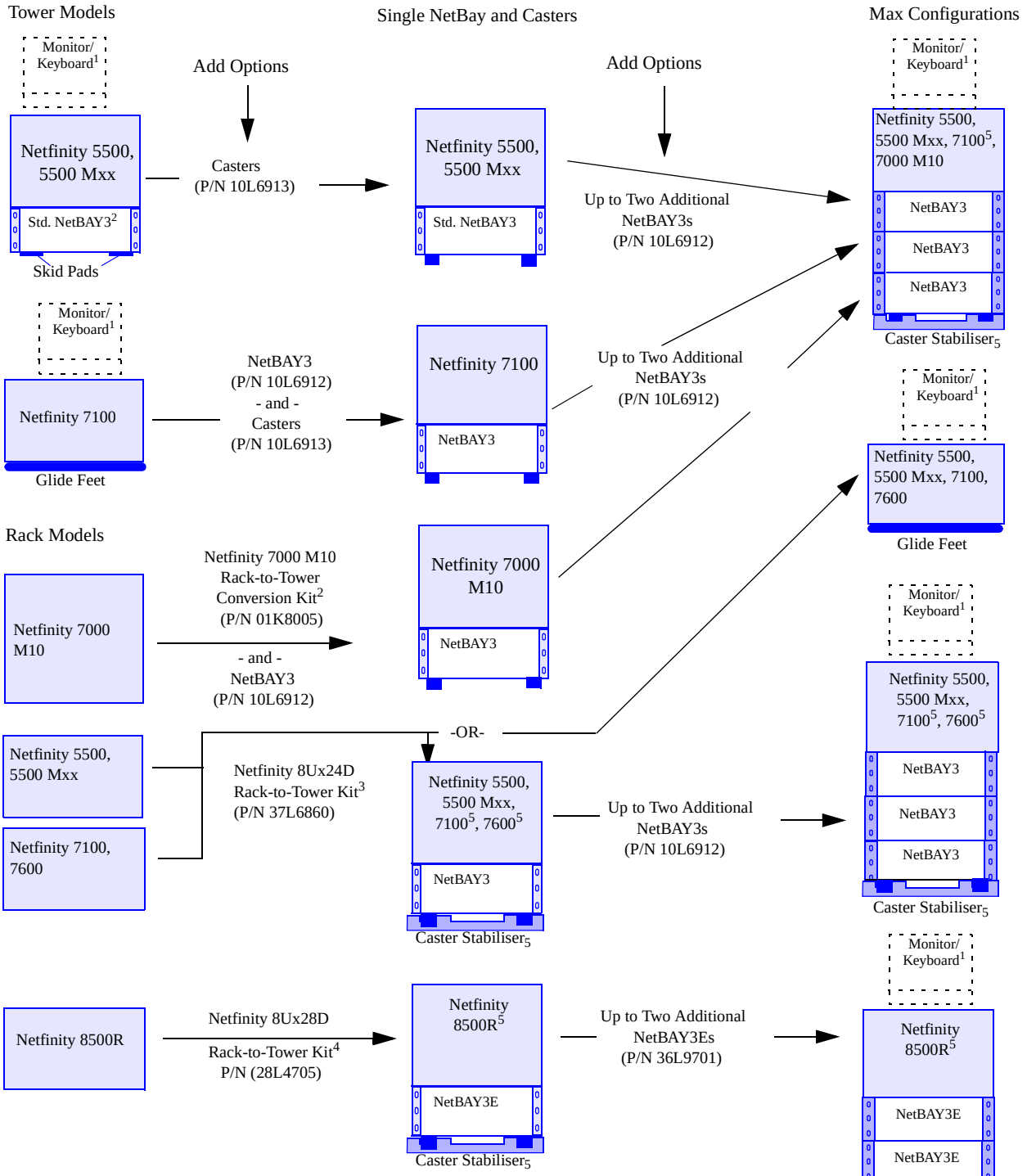
1) Locate power units with line cords in the bottom enclosure.
2) Install components starting from the bottom; start with the heaviest device.
3) If nothing is installed in the enclosure, attach the rear blank panel for stability.



Supported Devices	NetBAY3	NetBAY3E	Size (U)	Weight(lb/kg)	Max/Enclosure	Max/Stack
Servers[4]						
Netfinity 7600[1]	X	-	-	120/54.4	n/a	1
Netfinity 7100	X	-	-	120/54.4	n/a	1
Netfinity 7000-M10[2]	X	-	-	160/72.6	n/a	1
Netfinity 5500	X	-	-	120/54.4	n/a	1
Netfinity 5500-Mxx	X	-	-	123.4/56.0	n/a	1
Netfinity 8500R[3,5]	-	X		170/77.1	n/a	1
Expansion[4]						
Netfinity EXP200	X	X	3	80/36	1	3
Tape Units[4]						
NetMEDIA	X	X	3	37/17	1	3
Power[4]						
APC Smart-UPS 1400RMiB	X	X	3	55/24.9	1	1
APC Smart-UPS 3000RMiB	X	X	3	112/50.8	1	1
200-240V PDU	X	X	1	8/3.6	1	1
Networking[4]						
2210 Multiprotocol Router	X	X	1, 2	7/3.2, 20/9.1	3, 1	9, 3
8230 T-R Controlled Access Unit	X	X	2	15/6.8	1	3
8235 Dial-in Access to LANs	X	X	1	8/3.6	3	9
8237 Ethernet Hub	X	X	2	10/4.5	1	3
8238 Nways T-R Hub	X	X	2	11/5.0	1	3
8271 Ethernet Switch	X	X	2	16/7.3	1	3
8272 T-R Switch	X	X	2	16/7.3	1	3
8285 ATM Switch	X	X	3	70/31.8	1	3

1. Netfinity 7600 systems are rack mountable and ship without a keyboard or mouse. In order to be utilised with a NetBAY3 or in a tower configuration, optional 8Ux28D Rack-to-Tower Kit (P/N 28L4705) must be installed.
2. Netfinity 7000-M10 systems are rack mountable and ship without a keyboard. In order to be utilised with a NetBAY3 or in a tower configuration, optional Rack-to-Tower Conversion Kit (P/N 01K8005) must be installed.
3. Netfinity 8500R systems are rack mountable and ship without a keyboard. In order to be utilised with a NetBAY3E or in a tower configuration, optional Rack-to-Tower Kit (P/N 28L4705) must be installed.
4. NetBAY3 and NetBAY3E do not contain a top cover and therefore require a supported server as the top component in a stack
5. NetBAY3E supports the Netfinity 8500R and other devices that are 28 inches deep.

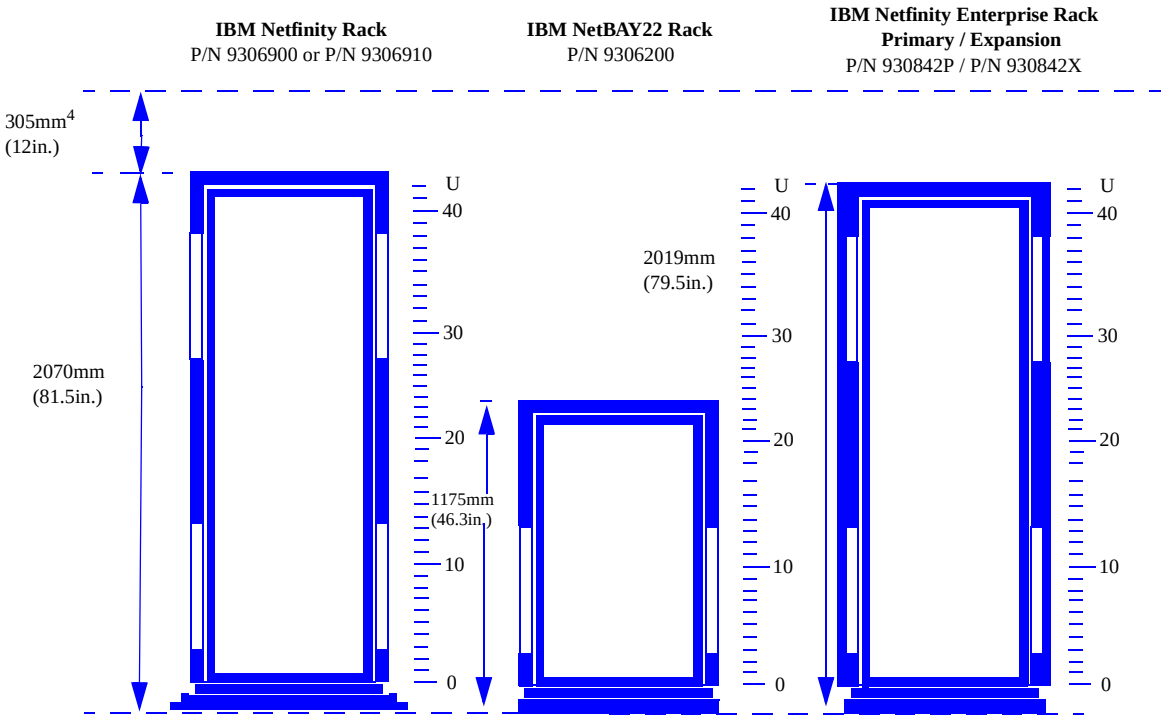
IBM Netfinity NetBAY3/3E Stackable Enclosure



1. Netfinity rack models ship without a keyboard or mouse. Those supported for stacking on a NetBAY3 or NetBAY3E must have a rack-to-tower kit installed.
2. Netfinity 7000 M10 Rack-to-Tower Conversion Kit P/N 01K8005 includes casters which can also be used with a NetBAY3.
3. Netfinity 8Ux24D Rack-to-Tower Kit P/N 37L6860 includes casters, caster stabiliser, glide feet and a single NetBAY3.
Either NetBAY3 or the glide feet may be utilised but not both.
4. Netfinity 8Ux28D Rack-to-Tower Kit (P/N 28L4705) includes casters, caster stabiliser, and a single NetBAY3E.
5. Netfinity 7100, 7600 and 8500R are not supported for installation with three empty NetBAY enclosures without a caster stabiliser. The caster stabiliser is included in Rack-to-Tower Kits P/N 37L6860 and P/N 28L4705 and is recommended for use with any quantity of NetBAY enclosures.

Rack Cabinet and Options

Note: For a robust rack configurator application access URL http://www.ibm.com/pc/europe/configurators



	IBM Netfinity Rack[1]		IBM Netfinity NetBAY22	IBM Enterprise Rack	
Ordering Part Number -->	**P/N 9306900**	**P/N 9306910**	**P/N 9306200**	**P/N 930842P**	**P/N 930842X**
EIA Capacity[6]	42U	42U	22U	42U	42U
Sidewall Compartments	4	4	2	4	4
Front Stabilizers	Std	Std	Std	Std	Std
Side Stabilizers	Std	Std	NR	NR	NR
Casters	Std	Std	Std	Std	Std
Leveling Feet	Std	Std	Std	Std	Std
Side Covers	P/N 94G6669 (Option)	Std	Std	Std	NR
Glass Front Door	Std	No	Std	Std	Std
Perforated Front Door[2]	P/N 06P6010 (Option)	Std	No	No	No
Empty Weight	125Kg	125Kg	83Kg	261Kg	234Kg
Max Load (Moveable)	374Kg	374Kg	338Kg	667Kg	667Kg
Max Load (Stationary)	1424lbs	1424lbs	338Kg	667Kg	667Kg
Total Weight (Moveable	499Kg	499Kg	421Kg	928Kg	901Kg
Total Weight (Stationary)	1700	1700	421Kg	928Kg	901Kg
Rack Extension Kit[1]	P/N 36L9703 (Option)	P/N 36L9703 (Option)	P/N 36L9702 (Option)	NR	NR
Rack Attachment Kit	P/N 94G7446[3] (Option)	P/N 94G7446[3] (Option)	NA	NR	Std

NR - Not Required NA - Not Available

1U= 1.75in= 44.45mm.

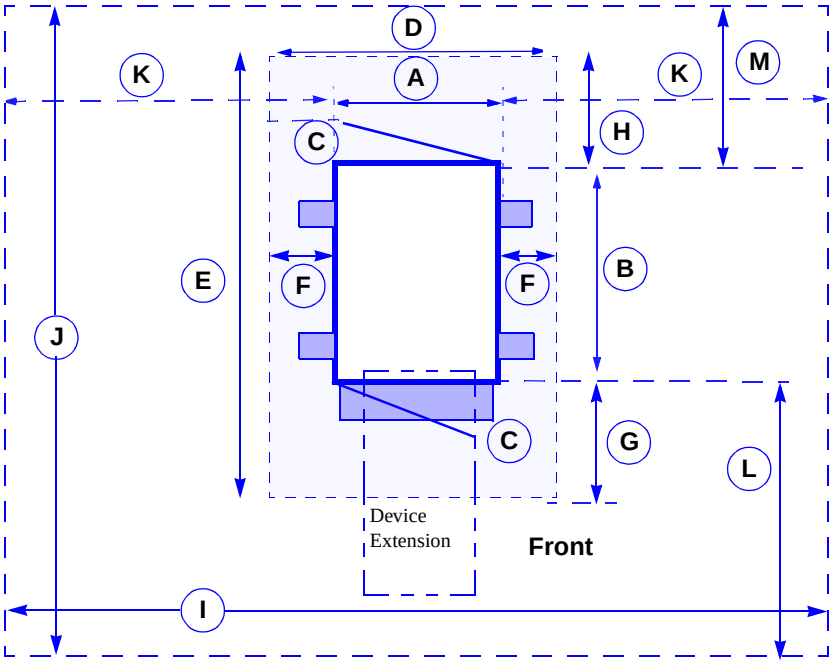
1. Rack Extension Kit adds 203mm (8inches) to rear of cabinet for cable management, recommended for systems greater than 610mm (24inches) in depth.
2. Improves air flow, recommended for 1U servers.
3. Required to attach racks together to make a suite.
4. Minimum clearance to the ceiling.
5. Display and keyboard may be placed on top of the NetBAY22.
6. Conforms to EIA 310 - D Standard 19inch (483mm) rack specification for a Type A cabinet with universal hole spacing.

IBM Rack Mounted Units					
Description	**Machine Type or Part Number**	**Size (U)[4]**	**Approx Weight (Kg)**	**Power (Watts) Typical /Max (All cords to same source)**	**Number of Power Supplies and Line Cords[6] (basic/max)**
Server System Units					
xSeries 200[1]	8478	4	19	245/350	1/1
xSeries 220[1]	8645	4	19	245/350	1/1
xSeries 330[2]	8654	1	13	140/200	1/1
Netfinity 4000R	8652	1	10	105/150	1/1
xSeries 340 / Netfinity 4500R	8656	3	28	270/415	1/2
xSeries 230 / Netfinity5100	8658	5	36	250/357	1/1
xSeries 230 / Netfinity5100 w/Pwr Upgrade[5]	8658	5	36	315/450	1/3[5]
xSeries 240 / Netfinity5600	8664	5	36	315/450	2/3
Netfinity 6000R	8682	3	34	365/525	1/3
Netfinity 7100	8666	8	56	350/475	2/4
Netfinity 7600	8665	8	56	350/475	3/4
Netfinity 8500R[3]	8681	8	73	1015/1450	3/3
Storage Units					
EXP200	P/N 00N6xxx	3	41	280/350	1/2
EXP300	P/N 19K11xx	3	41	285/360	2/2
FAStT200	P/N 19K11xx	3	25	275/390	2/2
FAStT200HA	P/N 19K11xx	3	25	275/390	2/2
FC RAID Controller Unit	P/N SFCU1xx	4	34	105/160	2/2
FAStT500 Storage Server	P/N 00N69xx	4	34	140/200	2/2
FAStT EXP500 Storage Expansion Unit	P/N 00N71xx	3	28	245/350	2/2
SAN FC Switch 8-port	P/N 2109S08	1	8	-/200	1/2
SAN FC Switch 16-port	P/N 2109S16	2	13	-/200	1/2
Tape Unit/Enclosure					
NetMEDIA	P/N 03K8756	3	17	130/185	2/2
DLT Tape Library	P/N 00N79xx	4	32	-/135	1/1

1. Requires 4Ux20D Tower-to-Rack Kit P/N 09N4300 to mount server unit into an EIA rack cabinet.
2. 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.
3. 8500R requires installation of extension kit P/N 36L9703 or P/N 36L9702 when installed in a Rack P/Ns 9306900/9306910 or P/N 9306200 respectively, for proper rear door clearance.
4. 1U= 1.75in= 44.45mm.
5. One power supply standard; the Hot-Swap Power Supply Upgrade Kit P/N 37L6881 allows one to three hot swap power supplies.
6. Standard Country Line Cords are supplied standard with all units. Rack Power Cord P/N 94G7448 (one for each power supply) must be ordered optionally if connecting to a high voltage UPS or PDU.
7. BTUs = Watts x 3.41
8. 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 UPS (including no more than two APC 5000 UPS) per rack.
- Utilise side compartments for mounting PDU's 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.

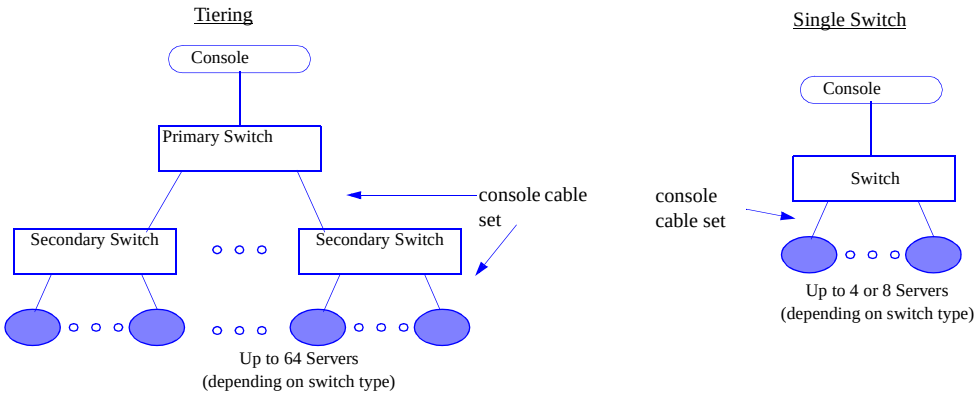
Rack Options		
Part Number	**Description**	**Information**
28L4707	Netfinity Rack Keyboard Tray	Supports Keyboards in racks, also used with Flat Panel Monitor Rack Mount Kit II
28L36xx[1]	Space Saver II Keyboard	1U, includes TrackPoint IV, requires Rack Keyboard Tray P/N 28L4707
94G7444	Monitor Compartment	
T3347xx[2]	E51 Color Monitor	9U, requires Monitor Compartment P/N 94G7444
T31U2xx[2]	E54 Color Monitor	9U, requires Monitor Compartment P/N 94G7444
T32U3xx[2]	E74 Color Monitor	10U, requires Monitor Compartment P/N 94G7444
T274Axx[2]	G78 Color Monitor	10U, requires Monitor Compartment P/N 94G7444
37L6888	Flat Panel Monitor Rack Mount Kit II	Requires Rack Keyboard Tray P/N 28L4707
11AG1xx[2]	T54A Flat Panel Color Monitor	3U, requires Flat Panel Monitor Rack Mount Kit II P/N 37L6888
28L0542	Console Server Selector Switch (4-port)[6]	1U, mounts in sidewall compartments, EIA space, or Monitor Compartment
94G7445	Console Server Selector Switch (8-port)[7]	1U, mounts in sidewall compartments, EIA space, or Monitor Compartment
09N4290	NetBAY 1 x 4 Console Switch[6]	1U, mounts in sidewall compartments, EIA space, or Monitor Compartment; supports one to four servers, one console
09N4291	NetBAY 2 x 8 Console Switch[7]	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	NetBAY Console Cable Set - 2.1m (7ft)	Connects servers to console switch
94G7447	NetBAY Console Cable Set - 3.7m (12ft)	Connects servers to console switch
2PDUxxx[3]	200-240V Power Distribution Unit[8]	1U, 200-240V, 16A, mounts in sidewall compartment or EIA space, 10 IEC 320-C13 outlets
37L68xx[4]	NetBAY Rack PDU[8]	1U, 100-240V, 15A, mounts in sidewall compartment or EIA space, 7 IEC 320-C13 outlets
37L68xx[5]	NetBAY Server Dual-cord PDU	1U, 100-240V, 15/10A, mounts in sidewall compartment or EIA space, 4 IEC 320-C13 outlets
37L6885	NetBAY 200-240V Single-phase Front-end PDU)	1U, 200-240V, shared 20A, mounts in sidewall compartment, 3 IEC 320-C19 outlets
37L6887	NetBAY 3-phase Front-end PDU)	1U, 200-415V, shared 30A, mounts in sidewall compartment, 3 IEC 320-C19 outlets
14RIxxx[3]	APC Smart-UPS 1400RMiB	3U, 220-240V, four - 10 Amp, IEC 320-C13 outlets
30RIxxx[3]	APC Smart-UPS 3000RMiB	3U, 220-240V, eight - 10 Amp IEC 320-C13 and one -16 Amp IEC 320-C19 outlets
37L6862	APC Smart-UPS 5000RMB	5U, 220-240V, eight - 10 Amp IEC 320-C13 and two -16 Amp IEC 320-C19 outlets
94G7446	Rack Attachment Kit	Used to attach Rack cabinets together P/N 9306900 and/or P/N 9306910 - to make into a suite
94G6669	Side Panel Kit	Used with Rack P/N 9306900 only
94G6670	Blank Filler Panel Kit	Consists of one 5U, one 3U, and two 1U blank filler panels
94G7442	Fixed Shelf	Supports equipment weighing up to a total of 45Kg
94G7448	Rack Power Cord -Type C12	IEC 320-C13 to IEC 320-C14 3.7m (12ft)

1. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
2. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
3. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.
4. Where 'xx' represents the appropriate country code as follows:- 66=US/Saudi Arabia, 68=EU, 70=Denmark/Switzerland, 72=Israel, 74=Italy, 76=South africa, P/N 06P6028=UK.
5. Where 'xx' represents the appropriate country code as follows:- 65=US/Saudi Arabia, 67=EU, 69=Denmark/Switzerland, 71=Israel, 73=Italy, 75=South africa, P/N 06P6027=UK.
6. Console Server Selector Switch P/N 28L0542 was withdrawn with effect from 15/01/01 - and is replaced by NetBAY 1x4 Console Switch P/N 09N4290.
7. Console Server Selector Switch P/N 94G7445 was withdrawn with effect from 15/01/01 - and is replaced by NetBAY 2x8 Console Switch P/N 09N4291.
8. 200-240V Power Distribution Unit P/N 2PDUxxx was withdrawn with effect from 15/01/01 - and is replaced by NetBAY Rack PDU P/N 37L68xx.

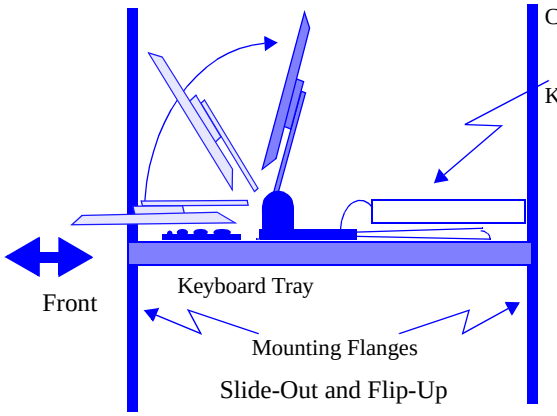


	Netfinity Rack and NetBAY 22 P/N 9306xxx millimetres(inches)	Enterprise Rack P/N 9308xxx millimetres(inches)	Description
Box Footprint			
Dimension A	597(23.5)	648(25.5)	Width of rack
B	876(34.5)	1105(43.5)	Depth of rack (not including front stabilizer)
C	610(24)	660(26)	Front and rear door clearance
Operational Clearance			
Dimension D	699(27.5)	749(29.5)	Width of Operational Clearance area
E	2248(88.5)	2794(110)	Depth of Operational Clearance area
F	51(2)	51(2)	Left/Right sides of rack to Operational Clearance area
G	762(30)	914(36)	Front of rack to Operational Clearance area
H	610(24)	660(26)	Rear of rack to Operational Clearance area
Service Clearance			
Dimension I	2426(95.5)	2477(97.5)	Width of Service Clearance area
J	3162(124.5)	3391(133.5)	Depth of Service Clearance area
K	914(36)	914(36)	Left/Right sides of rack to Service Clearance area
L	1524(60)	1524(60)	Front of rack to Service Clearance area
M	762(30)	762(30)	Rear of rack to Service Clearance area

Console Switch Arrangements



Keyboard/Pointer/Monitor & Switch ... all in 3U space



Console Switch

- Mounts to rear flanges
- Shares 3U space with display, keyboard and tray

Keyboard Tray Components

- P/N 28L4707 Netfinity Rack Keyboard Tray
- P/N 37L6888 Netfinity Flat Panel Monitor Rack Mount Kit II
- P/N 28L36xx Space Saver Keyboard
- P/N 11AG1xx T54A TFT Color Monitor

Appendix A: Tape Drive Attributes

Part Number	Withdrawn ddmmyy[13]	Description **Form Factor** LEGEND HH: Half High - approx. height of 1.6” SL: Slim Line - approx. height of 1” FH: Full High	SCSI Interface (bit)	Form Factor	Max GB-Native/Compr.[2]	MB/sec - Native/compr.[2]	Termination Incl.	68/50-pin Converter Incl.	Internal Cables	Data/Cleaning Cridges Std.	Ext. Tape Enclosures[1]
20L0549	-	10/20GB TR5 Internal IDE Tape Drive	-	89mm (3.5in) SL or 133mm (5.25in) HH	10/20	1/2	-	-	-	1/0	-
01K1282	31/08/00	12/24GB DDS/3 4mm Internal Tape Drive	8	89 mm (3.5”) HH or 133 mm (5.25”)HH	12/24	1.1/2.2	Y[3]	Y	-	1/1	10L7440 03K8756
09N4041	-	12/24GB DDS/3 4mm Internal Tape Drive	8	89 mm (3.5”) HH or 133 mm (5.25”)HH	12/24	1.1/2.2	Y	Y	-	1/1	10L7440 03K8756
00N7991	-	20/40 GB DDS/4 4-mm Internal Tape Drive	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”)HH	20/40	2.75/5.5	N	N/A	-	1/1	10L7440[4], 03K8756[3]
01K1319	31/08/00	10/20GB NS Internal SCSI Tape Drive	8	89 mm (3.5”) SL or 133 mm (5.25”)HH	10/20	1/2	Y	Y	-	1/0	10L7440, 03K8756
09N4042	-	10/20GB NS Internal SCSI Tape Drive	8	89 mm (3.5”) SL or 133 mm (5.25”)HH	10/20	1/2	Y	Y	-	1/0	10L7440, 03K8756
01K1325	-	20/40GB 8mm Internal SCSI Tape Drive	16	133 mm (5.25”)HH	20/40	3/6	N	N/A	-	1/1	10L7440[4], 03K8756
01K1320	25/08/00	20/40GB DLT SCSI Tape Drive	8	133 mm (5.25”)FH	20/40	1.5/3	Y	Y	-	1/1	03K8705, 03K8756
09N4040	-	20/40GB DLT Internal SCSI Tape Drive	8	133 mm (5.25”)FH	20/40	1.5/3	N	Y	-	1/1	03K8705[4], 03K8756
00N7990	-	40/80 GB DLT Internal SCSI Tape Drive	16 Ultra2 LVD	133 mm (5.25”)FH	40/80	6/10	N	N/A	-	1/1	03K8705[4], 03K8756[3]
00N8017	-	60/120 GB 8mm M2 SCSI Tape Drive	16 Ultra2 LVD	133 mm (5.25”)HH	60/120	12/24	N	N/A	-	1[12]	10L7440[4], 03K8756[3]
00N8016	-	100/200 GB LTO Tape Drive	16 Ultra2 LVD	133 mm (5.25”)FH	100/200	15/30	N	N/A	-	1/1	03K8756[3]
Associated Options											
00N7956	-	68-pin External Multimode LVD/SE SCSI Terminator	16 LVD/SE	Ext.	-	-	Y	N	-	-	10L7440, 03K8705
94G7587	-	PC Server SCSI Terminator Kit	8/16	Int.	-	-	Y	N	-	-	-
36L9636	-	Netfinity Two-Drop Internal SCSI Cable[6]	16	Int.	-	-	Y	N	16-bit, 2-drop	-	-
10K2340	-	Media Bay Tray and LVD Cable Kit[7]	16 LVD	Int.	-	-	Y	N	16-bit 2-drop	-	03K8756
Tape Autoloaders											
00N79xx[14]	-	DLT Tape Autoloader	16	Desktop	280/560	5/10	Y	-	-	1/1	-
00N7992	-	120/240 GB DDS/4 Tape Autoloader	16 Ultra2 LVD	133 mm (5.25”)FH	120/240	3/6	N	N	-	5/1	03K8756

Form Factor

LEGEND
HH: Half High - approx. height of 1.6”
SL: Slim Line - approx. height of 1”
FH: Full High

Part Number	Withdrawn ddmmyy[13]	Description	SCSI Interface (bit)	Form Factor	Max GB-Native/Compr.[2]	MB/sec - Native/compr.[2]	Termination Incl.	68/50-pin Converter Incl.	Internal Cables	Data/Cleaning Cartidge Std.	Ext. Tape Enclosures[1]
External Tape Enclosures											
10L7440	-	External Half High SCSI Storage Enclosure[8]	8/16	Desktop	-	-	N	N	8-bit or 16-bit	-	-
03K8756	-	NetMEDIA Storage Expansion Unit EL[9]	16	Rack	-	-	Y	N	16-bit, 4-drop	-	-
10L7113	-	NetMEDIA Systems Management Adapter[10]	16	-	-	-	N	N	N	-	03K8756
03K8705	-	DLT External SCSI Enclosure[11]	16	Desktop	-	-	N	N	16-bit	-	-

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.
2. Data compression typically provides a 2X improvenent in capacity and transfer rate, bur since data compression is affected by many factors, actual improvements may be more or less than 2X.
3. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop multi-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. Requires installation of the multi-mode terminated LVD cable from Media Bay Tray and LVD Cable Kit P/N 10K2340.
6. Netfinity Two-Drop Internal SCSI Cable P/N 36L9636 is a single-ended wide two-drop terminated cable.
7. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
8. Provides a black desktop 5.25” half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
9. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19” rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half-high (HH) extended length 5.25” bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two standard country power cords are also included. Tip: The front rail clips will need to be reversed and screwed in from behind to secure the unit in a 930842x rack.
10. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
11. Provides a black desktop DLT tape enclosure, with a 68-pin high density external connector. Requires termination by the tape drive or by installation of 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
12. A combination data/cleaning cartridge cleans the drive each time the data cartridge is used.
13. Not available from IBM after this date. Business Partner inventory may be available.
14. Where ‘xx’ represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.

Note: Tape support varies by system depending on internal bay availability, SCSI cabling type, number of cable drops, existence of a RAID controller and availability of a suitable external enclosure. The following general rules should be followed.
a) Tapes are not supported for attachment to RAID controllers.
b) Single-ended (non-LVD) devices may be attached to internal multi-mode terminated cables. The entire SCSI bus will be limited to single-ended operation with a maximum bus speed of Ultra-SCSI.
c) LVD devices attached to single-ended terminated cables will operate in single-ended mode with a maximum bus speed of Ultra-SCSI.

Internal SCSI Cables and Optional SCSI Adapters
Most systems support the following SCSI adapters for use with tape. Consult the I/O Options table in the system sections for specific system support. Where tapes are supported internal to the system, the cables which ship with the adapters are supported for tape attachment. Some restrictions may apply based on cable and tape type which are explaned in the note above.

Part Number	Description	Cable Description
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Four-drop, single-ended terminated, 16-bit
19K4646	PCI Wide Ultra160 SCSI Adapter	Five-drop, multi-mode terminated
36L9636	Netfinity Two-Drop Internal SCSI Cable	Two-drop, single-ended terminated, 16-bit
10K2340	Media Bay Tray and LVD Cable Kit	Two-drop, multi-mode terminated

Appendix B: Tape Library Attributes

SCSI INTERFACE

LEGEND
F: Female - External
M: Male - External
68: 16-bit, 68-pin High Density connector
0.8: 16-bit, 68-pin Very High Density Connection Interface (VHDCI) 0.8 mm connector
Diff: Differential SCSI

Part Number	Description	SCSI Interface	Form Factor	Terminator Included	External Cables Incl (M)	SCSI Controllers Incl	Data Cartridges std/max	Cleaning Cartridges std.	Cartridge Mags std./ Qty. of drives - std./	Max GB-Native/Comp	MB/sec[1] - Native/compr.
00N79xx[4]	DLT Tape Autoloader	M68	Desktop	Y	M0.8mm - F68 Converter	Y	1/7	1	1/1	1/1	280/560	5/10
00N79xx[5]	DLT Tape Library - Tower	M68	Desktop	Y	M68-M68 (3)	Y	1/14	1	2/2	1/3	490/980	5/10
00N79xx[5]	DLT Tape Library - Rack[2]	M68	4U Rack	Y	M68-M68 (3)	Y	1/14	1	2/2	1/3	490/980	5/10
33L4979	DLT Library Drive Upgrade[3]	M68	-	N	Jumper	N	-	-	-	-	-	5/10

1. 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, bur since data compression is affected by many factors , actual improvements may be more or less than 2X.
2. Includes Fixed Shelf P/N 94G7442 for installation in an IBM Rack or NetBAY22.
3. Upgrade 33L4979 is an additional drive for DLT Tape Libraries. Up to two tape drives may be installed for a maximum of three drives per DLT Tape Library
4. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
5. 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.

Appendix C: UPS Runtime Estimate (minutes)

Servers	# Pwr. Cords Std/Max	Watts Load Max./Typ.[1]
Netfinity 1000[2]	1/1	225/160
Netfinity 3000[2]	1/1	225/160
Netfinity 3500 M20[2]	1/1	430/300
Netfinity 4000R	1/1	150/105
xSeries 200[2]	1/1	350/245
xSeries 220[2]	1/1	350/245
xSeries 230 / Netfinity 5100[2]	1/3	450/315
xSeries 240 / Netfinity 5600[2]	2/3	450/315
xSeries 330[2]	1/1	200/140
xSeries 340 / Netfinity 4500R[2]	1/2	390/270
Netfinity 6000R[2]	1/4	525/395
Netfinity 7100[2]	2/4	475/330
Netfinity 7600[2]	3/4	475/330
Netfinity 8500R[2]	3/3	1450/1015
Other Devices		
Fibre Channel RAID Controller Unit (P/N SFCU1xx)[2]	2/2	160/105
FAStT500 Storage Server (P/N 00N69xx)[2]	2/2	200/140
FAStT EXP500 Storage Expansion Unit (P/N 00N71xx)[2]	2/2	350/245
FAStT200 Storage Server (P/N 19K11xx)[2]	2/2	390/275
FAStT200 HA Storage Server (P/N 19K11xx)[2]	2/2	390/275
EXP200 Storage Expansion Unit[2]	1/2	350/280
EXP300 Storage Expansion Unit[2]	2/2	360/285
SAN Fibre Channel Switch 8-port (P/N 2109S08)	1/2	200/n/a
SAN Fibre Channel Switch 16-port (P/N 2109S16)	1/2	200/n/a
SAN Data Gateway Router (SE) (P/N 2108R3S)	1/1	90/n/a
DLT Tape Autoloader and Library (P/N 00N79xx)	1/1	135/n/a
NetMEDIA Storage Expansion Unit EL (P/N 03K8756)	2/2	185/130

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, therefore, 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		
	EMEA P/N	SU-700iNET P/N SUP072Y	SU-1000iNET P/N SUP102Y	SU-1400iNET P/N SUP142Y	SU-2200iNET P/N 06P60xx[6]	SU-1400RMiB P/N 14RIxxx[7]	SU-3000RMiB P/N 30RIxxx[7]	SU-5000RMiB P/N 37L6862
	US P/N	SU-700NET 94G3134	SU-1000NET 94G3135	SU-1400NET 94G3136	Not Available	SU-1400RMB 94G6674	SU-3000RMB 94G6676	SU-5000RMB 37L6861
UPS Attributes[1]								
Communications Links to Servers		1	1	1	1	1	3	3
Color		black	black	black	beige	black	black	black
EIA Height		-	-	-	-	3U	3U	5U
EMEA Models								
50 or 60 Hz, single phase, VAC:		220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (xxx)[2,3]
10 Amp, IEC 320-C13 (Device) receptacles		4	4	4	8	4	8	8
16 Amp, IEC 320-C19 (PDU P/N 2PDUxxx) receptacles		-	-	-	1	-	1	2
Line Cord Receptacle (IEC 320-)		C14	C14	C20	C20	C14	C20	TB[5]
US Models								
50 or 60 Hz, single phase, VAC:		120 (120)[2]	120 (120)[2]	120 (120)[2]	-	120 (120)[2]	120 (120)[2]	200-220 (208)[2]
Receptacles (NEMA 5-15R)		4	6	6	-	6	8	-
10 Amp, IEC 320-C13 (Device) receptacles		-	-	-	-	-	-	8
16 Amp, IEC 320-C19 (PDU 94G7450) receptacles		-	-	-	-	-	-	2[4]
Line Cord Length, NEMA Plug		6 ft., 5-15P	6 ft., 5-15P	6 ft., 5-15P	-	6 ft., L5-15P	6 ft., L5-30P	8 ft., L5-30P

1. Data provided by APC.
2. How-to-Read example for 220-240(208): Input VAC is 220- 240 as is the UPS output when electric service is active. When electriic service is interupted 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 (PDU) (P/N 2PDUxxx).
5. SU-5000RMiB (P/N 37L6862) contains a Terminal Block (TB) for direct attachment to an electrical source by qualified personnel.
6.Where 'xx' represents the appropriate country code as follows:- 14=UK, 15=Denmark/Switzerland, 16=EUR, 17=Israel, 18=Italy, 19=South Africa.
7. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

	Total Configuration Runtime Estimator (Time in minutes)[1]						
	Tower				**Rack Mount**		
EMEA Part Number	SU-700iNET P/N SUP072Y	SU-1000iNET P/N SUP102Y	SU-1400iNET P/N SUP144Y	SU-2200iNET P/N 06P60xx[5]	SU-1400RMiB P/N 14RIxxx[6]	SU-3000RMiB P/N 30RIxxx[6]	SU-5000RMiB P/N 37L6862
US Part Number	SU-700NET 94G3134	SU-1000NET 94G3135	SU-1400NET 94G3136	Not Available	SU-1400RMB 94G6674	SU-3000RMB 94G6676	SU-5000RMB 37L6861
Total Load (Watts)	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes
200	22	38	62	130	45	104	240
250	17	28	43	104	34	84	200
300	12	22	34	85	25	70	166
350	9	18	29	71	22	58	145
400	7	14	23	65	18	52	125
450	5	12	20	52	15	45	110
500	-	11	18	43	13	38	97
550	-	9	16	38	11	35	87
600	-	8	13	34	10	31	76
650	-	7	12	31	9	29	68
700	-	6	11	28	8	26	63
750	-	-	10	25	8	24	59
800	-	-	9	23	7	22	55
850	-	-	8	21	7	20	51
900	-	-	7	19	6	18	47
950	-	-	6	18	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.
5. Where 'xx' represents the appropriate country code as follows:- 14=UK, 15=Denmark/Switzerland, 16=EUR, 17=Israel, 18=Italy, 19=South Africa.
6. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

NOTE: If the Total Configuration Load is greater than the entries above, split the load across two or more UPS units.

Appendix D: 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
0.8: 16-bit, 68-pin Very HighDensity Connection Interface (VHDCI) 0.8 mm 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 Enclosure Unit	EXP15 SE2RXxx	EXP200 00N6xxx[19]	EXP300 19K11xx	External HH SCSI 10L7440	DLT Ext. SCSI 03K8705	NetMEDIA 03K8756	NetMEDIA Adapter 10L7113
Max.MB/sec.)[1]	40	80	160	-	-	-	-
LVDS	X	X	X	-	-	-	-
Connector Type	F0.8	F0.8	F0.8	F68 or F50	F68	F0.8	F0.8
	2, 3	2, 4	2, 5	6	6, 7	2, 6	2, 6, 8

Description	Part Number	Max./ Channel (MB/sec)[1]	LVDS	Connector Type/ Max	Note #							
RAID Storage Controllers												
Netfinity Fibre Channel RAID Controller Unit	SFCU1xx	80	X	F0.8/6	9	A	A	-	-	-	-	-
Netfinity ServeRAID-4L Ultra160 SCSI Controller	37L6091	160	X	F0.8/1	13	A	A	A	-	-	-	-
Netfinity ServeRAID-4M Ultra160 SCSI Controller	37L6080	160	X	F0.8/2	13	A	A	A	-	-	-	-
Netfinity ServeRAID-4H Ultra160 SCSI Controller	37L6889	160	X	F0.8/4	13	A	A	A	-	-	-	-
Ultra160 SCSI Controllers												
PCI Wide Ultra160 SCSI Adapter	19K4646	160	X	F0.8/1	-	-	-	-	-	B	A	A
Netfinity 6000R - Ultra160 SCSI	Onboard	160	X	F0.8/1	-	-	-	-	-	-	A	A
Ultra2 SCSI Controllers												
Netfinity 3000 - Model P/Ns 780UExx and up	Adapter	80	X	F68/1	-	-	-	-	C	C	-	-
xSeries 240 / Netfinity 5600	Onboard	80	X	F0.8/1	-	-	-	-	B	B	A	A
Netfinity 7100	Onboard	80	X	F0.8/1	-	-	-	-	B	B	A	A
Netfinity 7600	Onboard	80	X	F0.8/1	14	-	-	-	B	B	A	A
Netfinity 8500R	Onboard	80	X	F0.8/1	-	-	-	-	B	B	A	A
Ultra SCSI Controllers												
PCI Fast/Wide Ultra SCSI Adapter	02K3454	40	-	F68/1	-	B[11]	B[11]	-	C	C	B[23]	B
Netfinity 3000 - Model P/Ns 771UExx and before	Adapter	40	-	F68/1	-	-	-	-	C	C	-	-
Netfinity 4000R - non-RAID models	Adapter	40	-	F68/1	-	-	-	-	-	-	B	-
No Onboard External Port[22]												
Netfinity 1000 Value Model (IDE)	N/A	-	-	N/A	15	-	-	-	-	-	-	-
Netfinity 3500 M20	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
Netfinity 4000R - RAID models	Adapter	80	X	F0.8/1	21	-	-	-	-	-	-	-
xSeries 200	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 220	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 330	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 340 / Netfinity 4500R	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 230 / Netfinity 5100	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
Related Options												
0.8mm to 68-pin SCSI Adapter	01K8017	-	-	M0.8-F68	16	-	-	-	-	-	-	-
Cable Group A (M0.8-M0.8)												
Netfinity 2M Ultra2 SCSI Cable	03K9310	-	X	M0.8-M0.8	17	X	X[18]	X[18]	-	-	X	X
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	-	X	M0.8-M0.8	17	X	X	X	-	-	X	X
Netfinity 20 M Ultra2 SCSI Cable	37L7101	-	X	M0.8-M0.8	10	X[10]	X[10]	X	-	-	-	-
Cable Group B (M68-M0.8)												
IBM 2M External .8mm SCSI Cable	01K8027	-	-	M68-M0.8	-	X	X	X	X	X	X	X
Cable Group C (M68-M68)												
PC Server F/W to F/W External SCSI Cable-1m	SS2C02Y	-	-	M68-M68	23	-	-	-	X	X	-	-
Cable Group D (Short Wave Fibre)[19]												
Netfinity Fibre Channel 1 M Cable	36L9973	-	N/A	S/W Fibre	-	-	-	-	-	-	-	-
Netfinity Fibre Channel 5 M Cable	03K9306	-	N/A	S/W Fibre	-	-	-	-	-	-	-	-

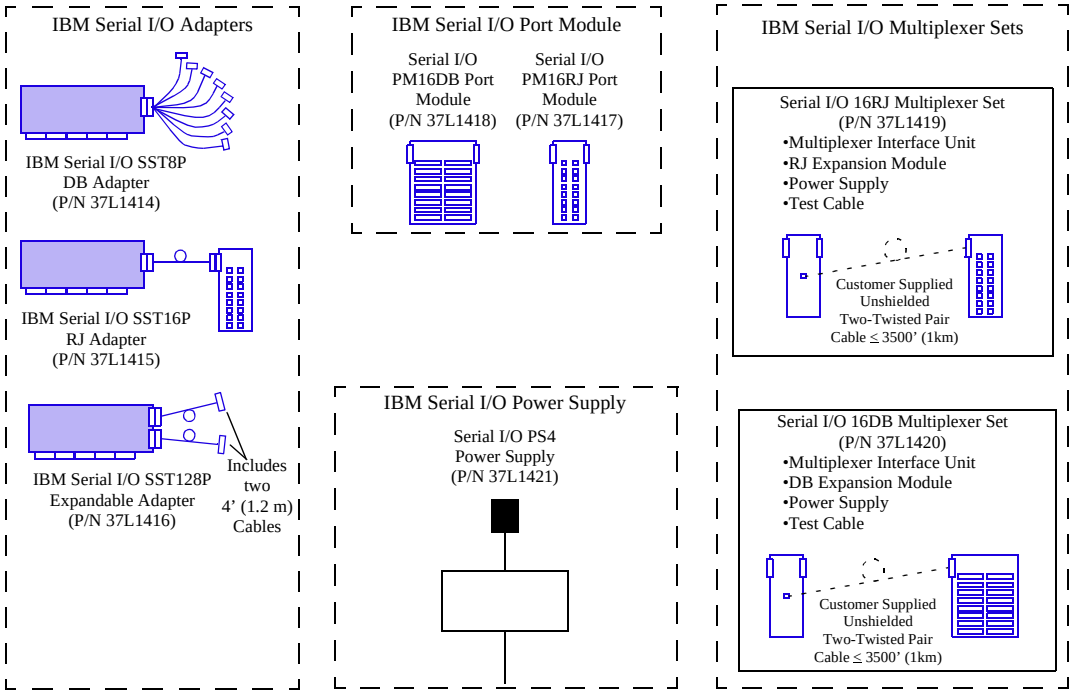
F: Female - External
M: Male - External
I: Internal
68: 16-bit, 68-pin High Density connector
50: 8-bit, 50-pin Centronix Connector
0.8: 16-bit, 68-pin Very HighDensity Connection Interface (VHDCI) 0.8 mm connector
16: 16-bit, 68-pin connector
8: 8-bit, 50-pin connector

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.

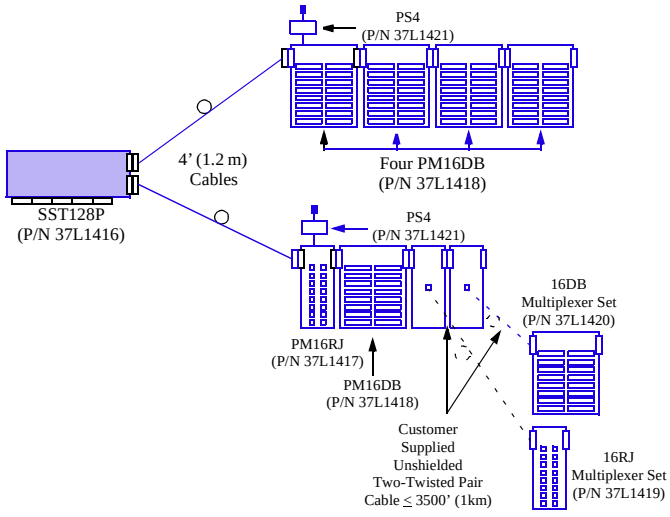
						Storage Enclosure Unit	**EXP15 SE2RXxx**	**EXP200 00N6xxx[19]**	**EXP300 19K11xx**	**External HH SCSI 10L7440**	**DLT Ext. SCSI 03K8705**	**NetMEDIA 03K8756**	**NetMEDIA Adapter 10L7113**
						Max.MB/sec.)[1]	40	80	160	-	-	-	-
						LVDS	X	X	X	-	-	-	-
						Connector Type	F0.8	F0.8	F0.8	F68 or F50	F68	F0.8	F0.8
Description	**Part Number**	**Max./ Channel (MB/sec)[1]**	**LVDS**	**Connector Type/ Max**	**Note #**		2, 3	2, 4	2, 5	6	6, 7	2, 6	2, 6, 8
Netfinity Fibre Channel 25 M Cable	03K9305	-	N/A	S/W Fibre	-		-	-	-	-	-	-	-
Customer supplied cables ≤500M (0.31 miles)	**********	-	N/A	S/W Fibre	-		-	-	-	-	-	-	-
Cable Group E (Long Wave Fibre)[19]													
Customer supplied cables ≤ 10 KM (6.2 miles)	**********	-	N/A	L/W Fibre	-		-	-	-	-	-	-	-
Cable Group G (Other)													
68-pin External Multimode LVD/SE SCSI Terminator	00N7956	-	-	M68	-		-	-	-	X	X	-	-
GBIC[19]													
Netfinity Fibre Channel Short-Wave GBIC	03K9308	-	N/A	S/W Fibre	20		-	-	-	-	-	-	-
Netfinity Fibre Channel Long-Wave GBIC	03K9307	-	N/A	L/W Fibre	-		-	-	-	-	-	-	-

1. Maximum supported speeds may be limited by installation of lower speed devices, controllers or cable lengths greater than 2 meters.
2. Rack installation cable management requires devices to have a minimum cable length of 2 meters. Cable length requirements will vary based on placement within a single or multiple rack suite.
3. Attachment to wide ultra SCSI controllers limits operational speeds to Ultra SCSI (40 MB/s) for cables up to 2 meters in length and Fast/Wide SCSI (20 MB/s) for cable lengths between 2 meters and 4.3 meters. Ultra2 SCSI controllers and cables allow cable lengths of up to twenty meters at up to 40 MB/s.
4. Attachment to wide ultra SCSI controllers limits operational speeds to Ultra SCSI (40 MBps) for cables up to two meters in length and Fast Wide (20 MBps) for cable lengths between 2 meters and 4.3 meters. Ultra2 SCSI controllers and cables allow cable lengths up to 20 meters at up to 80 MBps.
5. Maximum speeds may be limited by the installed devices or SCSI controller.
6. Daisy chaining tape enclosures is not supported at this time.
7. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
8. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
9. Connection to either IBM SAN Fibre Channel Managed Hub (P/N 35L1647) or Netfinity Fibre Channel PCI Adapter (P/N 01K7297) requires short wave fibre cables from Cable Group D.
10. Cable lengths exceeding 4.3 meters are NOT supported for attachment to non-Ultra-2 controllers.
11. Installations with cable lengths greater than 2 meters are limited to SCSI Fast/Wide speeds of 20MB/S .
12. RAID support for tape drives is limited to Non-RAID functions and utilisation of a dedicated channel.
13. Maximum speeds may be limited by the enclosure or installed devices.
14. Netfinity 7600 also includes a Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086). See ServeRAID-3HB for connectivity requirements.
15. Does not support external attachment of SCSI devices attached to optional controllers.
16. Converts a F0.8mm into a F68-pin connector for attachment of an external M68 cable .
17. Supports attachment to Ultra-2 or single-ended SCSI controllers with operational speeds of up to Ultra-2. Controller, storage unit, cable length or storage device limitations may apply (see Max. MB/sec row and column above).
18. Netfinity EXP200 (P/N 00N6xxx) and EXP300 (P/N 19K11xx) include a single 2 metre Ultra2 SCSI cable similar to Netfinity 2 M Ultra2 SCSI Cable (P/N 03K9310).
19. See Fibre Array Solutions section for device attachment.
20. Short wave GBICs are included with various devices. See Fibre Array Solutions section for specific details.
21. The RAID adapter has both an internal and external port. Only one of the two ports may be used. The internal HDDs are attached to the RAID adapter therefore the external port must not be used.
22. 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. The Netfinity 4000R does not support customer installation of adapters that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
23. Not supported for use in a rack. Rack installations require a minimum cable length of two meters.

Appendix E: IBM Serial I/O



Sample Configurations



37L1414	Serial I/O SST8P DB Adapter[1, 5]
37L1415	Serial I/O SST16P RJ Adapter[2, 5]
37L1416	Serial I/O SST128P Expandable Adapter[3, 5]
37L1417	Serial I/O PM16RJ Port Module[4]
37L1418	Serial I/O PM16DB Port Module[4]
37L1419	Serial I/O 16RJ Multiplexer Set[4, 6]
37L1420	Serial I/O 16DB Multiplexer Set[4, 6]
37L1421	Serial I/O PS4 Power Supply[4]

1. Intelligent serial I/O interface card providing eight DB-25 RS232 serial connections using an octopus cable. Support for all ports at 921.6 Kbps simultaneously.
2. Intelligent serial I/O interface card providing sixteen RJ-45 RS232 serial connections in a breakout box. Support for all ports at 115.2 Kbps simultaneously.
3. Intelligent interface card providing up to 128 RS232 serial connections (DB25 or RJ45) configured in 16 port increments utilizing any combination of Port Modules and Multiplexer Sets. Includes two 4' (1.2 m) bus cables. Each 4' cable supports attachment of 1 to 4 Port Modules and/or Multiplexer Interface Units for a total of 8 per adapter. The first Port Module or Multiplexer Set attached to a cable requires a Serial I/O PS4 Power Supply (P/N 37L1421). Support for all ports at 115.2 Kbps simultaneously.
4. Port Modules and Multiplexer Sets attach directly to one the two standard 4' (1.2m) bus cables of the Serial I/O SST128P Expandable Adapter (P/N 37L1416) or directly to 1 or more Port Modules or Multiplexer Sets already attached to one of the cables. A maximum of 4 Port Modules or Multiplexer Sets may be attached to single cable. The first Port Module or Multiplexer Set attached to a cable requires a Serial I/O PS4 Power Supply (P/N 37L1421).
5. 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.
6. Requires a customer supplied Unshielded Two-Twisted Pair (Catagory 3 minimum) cable with a maximum length of 3,500 feet (1 Km).

Appendix F: Useful URLs

URL	PURPOSE
www.ibm.com/pc/us/compat	ServerProven compatibility charts
www.ibm.com/pc/europe/configurators	European configurator download site
www.developer.ibm.com/welcome/myvc.pl	Consulting Engine for xSeries / Netfinity includes Solution Sizing Tools download site
www.ibm.com/services/uk/portfolios/servicepac	ServicePac Services includes ServicePac Selection Guide
www.ibm.com/pc	PC Products - Country Selector page
www.ibm.com/pc/us/techlink/srvperf.html	Benchmark data
www.ibm.com/pc/ww/eserver/xseries/clustering/ index.html	Clustering Information

Important Notes

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MHz measures microprocessor internal clock speed, not application performance. Many factors affect application performance.

When referring to storage capacity, GB stands for one billion bytes.Total user-accessible capacity may be less.

Tape Drives which utilise data compression technology have storage capacity that will vary depending upon whether the drive is operating in native mode (without compression) or compressed mode. Actual storage capacity will vary based upon many factors and may be less than the maximum possible.

Maximum internal hard disk drive capacities assume the replacement of any hard disk drives and the population of all hard disk drive bays with the largest currently supported drives available from IBM.

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