

http://www.ibm.com/servers/eserver/education/cust/xseries/xref.html

Bugfix	Ports	no serial or parallel ports	one serial / no parallel ports

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IBM® Type-model Processor GHz¹ Memory Disk and rpm	Disk Graphics ada controllers Optical and memo	
6224-10U 1xOpteron™ 244 1.81GB 80.0GB² SATA 7.2I	SATA, EIDE CD Quadro4 280NV	S 64MB 6x6 1394 XP Pro May 2004
6224-20U 1xOpteron 246 2.0 1GB 80.0GB SATA 7.2k 6224-30U 1xOpteron 248 2.2 1GB 80.0GB SATA 7.2k	SATA, EIDE CD-RW Quadro4 280NV	S 64MB 6x6 1394 XP Pro May 2004
6224-33U 1xOpteron 248 2.2 1GB 36.4GB U320 10K 6224-35U 1xOpteron 248 2.2 1GB 36.4GB U320 10K	Ultra320,EIDE CD-RW Quadro FX 1100 Ultra320,EIDE Combo Quadro FX 3000	
6224-37U 1xOpteron 248 2.2 2GB 36.4GB U320 10K 6224-38U 1xOpteron 248 2.2 1GB 36.4GB U320 10K	Ultra320,EIDE CD-RW Quadro4 280NV3 Ultra320,EIDE Combo Quadro FX 1100	S 64MB 6x6 1394 RHEL3-WS May 2004
6224-39U 1xOpteron 248 2.2 2GB 36.4GB U320 10K	Ultra320,EIDE Combo Quadro FX 3000	256MB 6x6 1394 RHEL3-WS May 2004
Processor 1 x AMD® Opteron 244, 246 or 248 L2 cache 1MB standard and maximum / at pro		
Processor upgrade 2-way SMP / up to two Opteron Pr		M slots six slots (five PCI-X (one with
ServeRAID 6i Plus support), one 8X	(AGP), and integrated SATA, SCSI, IEEE	1394a, USB 2.0, AC-97 and ethernet.
Memory - std / max 1GB or 2GB std / 16GB <sup>13</sup> max / two slo	CPU socket are provided with purchase of	•
Memory - features PC3200 400MHz registered 184-pin EC in matched pairs [a bank] / 2-way mem	CC CL3 DDR-SDRAM DIMMs / four DIMM slot ory interleave / dual channel / <b>Error Checking</b>	s on systemboard / DIMMs must be installed and Correcting (ECC) via 16-bit Checksum
Graphics controller (see IntelliStation Graphics sheet for	rs on same chip and detects 2- through 8-bit e	rrors contained in two chips)
(one of following) • NVIDIA™ Quadro 4 280NVS • NVIDIA Quadro FX 1100	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
NVIDIA Quadro FX 1100     NVIDIA Quadro FX 3000		
IDE disk controller Enhanced IDE busmaster / ATA-13: SATA disk controller Silicon Image 3512A / dual chann (mirroring) supported		
SCSI disk controller Adaptec® AlC7902W / dual chann Host RAID 0 (striping) or 1 (mirrorin		sec) / on planar / 64-bit 100MHz PCI-X /
SCSI channels Two 16-bit channels (one internal a	nd one external) / Internal channel: one 4-	drop 16-bit 68-pin LVD SCSI cable from
systemboard to rear external 68-pin	External channel: Optionally available 1-connector (cable available as option part	
External SCSI Interface Kit (VHCDI) Cables One SATA cable, one 2-drop EIDE	) (option part number 24P7973) cable (to optical) and one SCSI cable (liste	ed above)
	1 / 9.0 ms seek; <i>Some:</i> 36.4GB Ultra320 SC	
	-rack kit option (part number 09N4300) or AGP 8X slot / AMD 8111 I/O Hub / Four 64-l	oit PCI-X buses (Bus A for slot 1, Bus B for slot
	and 6), PCI 2.2 bus (one slot), ATA-133 EIDE,	
Gigabit ethernet One gigabit 10/100/1000 ethernet co	ntroller / Broadcom BCM5703ci / full gigabit	ethernet MAC and PHY layer functions /
	z / full duplex / Wake on LAN® / Alert Štand M, 48X/24X/48X/16X Max <sup>6,19</sup> CD-RW/DVD-ROI	
IEEE 1394(FireWire) Integrated IEEE 1394a, 400Mbps, 6	-pin port on rear, 4-pin port on front (ALC655) / internal speaker (use of audio lir	
Rear ports Three USB (Ver 2.0), two 9-pin serial	parallel, keyboard, mouse, ethernet, audio li	ne in/out, mic in / 6-pin IEEE 1394a
Front ports Two USB (Ver 2.0), audio line out (s Systems mgmt Autonomous monitoring and alerting		
	/ IBM three button mouse (6-pin PS/2 conn)	0=001
Cooling fans Three variable speed fans (power su / not redundant or hot-swap		U-bolt anchoring feature (U-bolt is optional; supports optional padlock)
	/ built-in overload and surge protection	Security slot (for attachment of optional cable lock such as Kensington cable lock)
Optical Bay ① 5.25", HH 1.6", access, optical Bay ② 5.25", HH 1.6", access, open	Metal cage for disk bays 4,5,6 rotates out of chassis	Cover key lock
Bay 33.5". SL 1". access. open	Two front stabilizing feet	Cover tamper detect switch     Secure fixed DASD
Bay $\oplus 3.5$ ", SL 1", no access,open Bay $\oplus 3.5$ ", SL 1", no access,open Bay $\oplus 3.5$ ", SL 1", no access,open	<ul> <li>⇒ Handle grip on top</li> <li>⇒ H 17.375" x W 6.5" x D 19.375"</li> </ul>	Power-on password     Administrator password
Bay € 3.5", SL 1", no access,disk  Slot 1: fullsize,64-bit 100MHz, PCI-X 1.0	⇒ H 441mm x W 165mm x D 492mm ⇒ 36 lb to 45.8 lb (16.3kg to 20.8kg)	Boot sequence control
Slot 2: 2/3 size, 64-bit 133MHz, PCI-X 1.0 Slot 3: fullsize, 64-bit 100MHz, PCI-X 1.0*		Boot without keyboard or mouse     Diskette boot inhibit
Slot 4: fullsize, AGP 8X (1.5v)	Maximum internal disk capacity <sup>13</sup> :     SCSI: 584GB (4 disks x 146GB)	Disable mouse     Diskette, disk, serial port, parallel port
Mini-tower - used by std AGP graphics adapter  Raven   Slot 5: fullsize, 64-bit 100MHz, PCI-X 1.0	SATA:320GB (2 disks x 160GB)	I/O control • VPD stored in EEPROM
Slot 6: fullsize, 64-bit 100MHz, PCI-X 1.0  * Extended slot	<ul> <li>Removable left side panel</li> <li>BIOS Setup Utility via F1 at startup</li> </ul>	<ul> <li>Write protection control for EEPROM</li> </ul>
Opteron model 244 (1.8GHz) Proc Upgrade 13N0740	Adaptec Configuration Utility near startup by pressing CTRL+A	IBM Security Solutions
Opteron model 246 (2.0GHz) Proc Upgrade 13N0741 Opteron model 248 (2.2GHz) Proc Upgrade 13N0742	Product Recovery Program via F11 at startup	
2x512MB PC3200 CL3 ECC DDR-SDRAM DIMM 73P3233 2x1GB PC3200 CL3 ECC DDR-SDRAM DIMM 73P3234	Adv Config Power Interface (ACPI) 2.0	
2x2GB PC3200 CL3 ECC DDR-SDRAM DIMM 73P3235	DMI 2.2-compliant	<ul> <li>⇒ 3 year parts and labor</li> <li>⇒ International Warranty Service<sup>3</sup></li> </ul>
IBM 36.4GB 10K rpm Ultra320 SCSI HDD 32P0723 IBM 73.4GB 10K rpm Ultra320 SCSI HDD 32P0724	Preload with Redhat Enterprise Linux 3 WS (64-bit) or	Ch site 9 am through 5 pm
IBM 146GB 10K rpm Ultra320 SCSI HDD 32P0725 IBM 80GB 7.2K rpm SATA-150 HDD 9N4253	Windows XP Professional (32-bit) <sup>17</sup> ⇒ Device Drivers CD	next business day response time
IBM 160GB 7.2K rpm SATA-150 HDD 09N4254 IBM ThinkVision L200P 20.1inLCD Black A/D 6736-HB0	♦ IBM IntelliStation Documentation CD	<ul> <li>On site warranty service upgrade options<sup>7</sup> available as ServicePac</li> </ul>
IBM T221 22.2inLCD Black Digital 9503-DG3	Disk-to-Disk Recovery (in service partition)	options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
IBM 4Ux20D Tower-to-Rack Conversion Kit 09N4300 Other options at ibm.com/pc/us/accessories		24x7 <sup>14</sup> toll-free support for warranty
·		issues during the warranty period <sup>1</sup>

		(0224) Octo			XHEF DY 65		-	STATE OF THE PARTY NAMED IN	and the same of
IBM® Type-GAV Proce	essor GHz <sup>1</sup> M	lemory Disk and rp	Dis om contro		Graphics adapt and memory		ts x ys FireWire	Preload <sup>17</sup>	Available date
6224-40U 1xOpter 6224-42U 1xOpter 6224-43U 2xOpter 6224-45U 1xOpter 6224-46U 1xOpter 6224-48U 2xOpter 6224-49U 2xOpter	on 250 2.4 20 on 250 2.4 20 on 250 2.4 20 on 250 2.4 20 on 250 2.4 20	GB 80.0GB SATA GB 80.0GB SATA GB 36.4GB U320 GB 36.4GB U320 GB 80.0GB SATA	A 7.2K SATA, A 7.2K SATA, O 15K Ultra320 O 15K Ultra320 A 7.2K SATA,E	EIDE CD-RW EIDE Combo 0,EIDE CD-RW 0,EIDE Combo EIDE CD-RW	Quadro™ NVS 280 Quadro FX1100 12 Quadro FX 4000 29 Quadro NVS 280 6 Quadro FX 1100 12 Quadro FX 1100 12 Quadro FX 4000 29	8MB 6 56MB 6 4MB 6 28MB 6 28MB 6			Dec 2004 Dec 2004 Dec 2004 Dec 2004 Dec 2004 Dec 2004 Dec 2004
Processor L2 cache Processor upgrade Implementation	1MB standar 2-way SMP Systemboard ServeRAID 6	l contains one AM i Plus support; or	at processor spon Processors  OD Socket 940  De AGP 8X), and	(same speed/ca micro PGA ZIF s d integrated SAT	che size) socket, four DIMM A, SCSI, IEEE 139 with purchase of o	)4a, USB	3 2.0, AC-9	7 and Ethe	ne with ernet.
Memory - std / max Memory - features	PC3200 (512)	MB, 1GB) or PC270	<b>00</b> (2GB) 400MH	z registered 184-p	ditional slots available in ECC CL3 DDR-SI 2-way memory interle	Dram'di	MMs / four	DIMM slots	on
Graphics controller (one of following	· • NVIDIA™ C ) • NVIDIA Qu	ation Graphics she Quadro NVS 280 A adro FX 1100 AG adro FX 4000 AG	AGP 8X SP 8X	nics specifications	s)				
		je 3512A / dual d			two connectors on 150MB/sec) / on p		lostRAID 0	(striping)	or 1
SCSI disk controlle SCSI channels and cables	r Adaptec Al Two 16-bit cl systemboard systemboard	C7902W / dual c nannels (one inter to internal disks	rnal and one ex bays; <i>External</i> 68-pin connecto	ternal) / Internal channel: Option or (cable availabl	er (LVD 320MB/se channel: one 4-dro ally available 1-dro e as option part nu 7973)	p´ 16-bit p 16-bit	68-pin LVE	O SCSI cal	ble from ble from
Cables Disk - features					SCSI cable (listed 4GB Ultra320 SCSI		n / 3.6 ms;	All: S.M.A	.R.T.⁵
Mechanical Chipset	Dual AMD 81	31 chipset / AMD 8	8151 for AĠÞ 8X	slot / AMD 8111 I	kit option (part nun /O Hub / Four 64-bit 8 / NS PC87363 Supe	PCI-X bu		for slot 1, B	us B for slot
Gigabit Ethernet Optical drives	chip on plana One of the foll	10/100/1000 Ether or / PCI-X 64-bit 10 owing: 48X/24X/48	rnet controller / 00MHz / full dup X/16X Max <sup>6,19</sup> CD	Broadcom BCM5 blex / Wake on L/ D-RW/DVD-ROM (	703ci / full Gigabit I AN® / Alert Standard Combo, 48X/24X/48X	Ethernet d Format Max <sup>6</sup> CD	MAC and I 1.03 / one -RW or IBN	PHY layer rear RJ-4 /I Multi-Burr	functions / 5 port ner Plus
IEEE 1394 (FireWire Audio Rear ports Front ports Systems mgmt	Audio AC '97 Three USB (\ Two USB (Ve	v2.2 interface via	8111 (ALC655) serial, parallel, k out (stereo), mi	/ internal speake reyboard, mouse, ic in / 4-pin IEEE	r (use of audio line Ethernet, audio line 1394a				
Keyboard / mouse Cooling fans Power supply	Three variabl / not redunda	keyboard (6-pin P e speed fans (pov nt or hot-swap niversal / auto ser	wer supply, two	in rear) / one fan	e protection	optional; Security	nchoring fea supports o slot (for atta	ptional pad achment of	lock) optional
Optical Bay	t 1: fullsize, 64-l	", access, open ", no access, dis ", no access, op ", no access, op bit 100MHz, PCI-X	rotate Two Hand en H 17 H 43 H 36	I cage for disk bases out of chassis front stabilizing felle grip on top .25" x W 6.5" x D 8mm x W 165mm to 45.8 lb (16.3k	eet  19.0"  1 x D 483mm  g to 20.8kg)	Cover ta Cover ta Secure f Power-o Administ Boot sec	ck such as hey lock mper detectived DASD n password trator password quence cor	et switch I vord ntrol	
Mini-tower Raven black	t 3: fullsize, 64-lt t 4: fullsize, AG used by std A( t 5: fullsize, 64-lt t 6: fullsize, 64-lt h ServeRAID 6 CL3 ECC DDR-	GP graphics adapt bit 100MHz, PCI-X bit 100MHz, PCI-X Bi Plus support SDRAM DIMM 73P	SCSI: SATA 640GE Serve 1.0* P3233 P3233 SCSI: SATA 640GE Serve PRemo BIOS Adapt startup	num internal disk 584GB (4 disks :320GB (2 disks 3 w/ 4 disks, req RAID-7t)) vable left side pa Setup Utility via ec Configuration p by pressing Ci	x 146GÉ) x 160GB; uires anel F1 at startup Utility near TRL+A	Disable r Diskette I/O contr VPD sto Write pro	, disk, seria	l port, para ROM atrol for EEI	
1x2GB PC2700 CL3 IBM ServeRAID-71 S IBM ServeRAID-61+ IBM 36.4GB 10K rp IBM 73.4GB 10K rp IBM 146GB 10K rp IBM 80GB 7.2K rp IBM 160GB 7.2K rp IBM ThinkVision L2C IBM 7221 22.2in LC IBM 4Ux20D Towe Other options at <b>ib</b>	SATA controller SCSI controller MITTA 20 SCS MUITTA 20 SCS MUITTA 20 SCS SATA-150 HD MSATA-150 HD MSATA-150 HD DP 20.1 in LCD D Business Blar-to-Rack Conve	71F 13N 32F SI HDD 32F I HDD 32F D 09N DD 09N DD 673 Slack A/D 678 Ck Digital 950 ersion Kit 09N	9270 98648 92190 90723 90724 90725 14253 14254 16-HB0 93-DG5 \$\phi\$ Devices \$\phi\$ IBM In	p config Power Intel: 2-compliant  Preload w Enterprise Linu or ows® XP Profess e Drivers CD ntelliStation Docu o-Disk Recovery	ith IX® 3 WS (64-bit)  sional (32-bit) <sup>17</sup> Imentation CD	Internation Intern	parts and I ational Ware, 8 am throrrough Fri e usiness day e warranty s' availabl s at http:///ees/us/its/py toll-free su during the	abor ranty Servi pugh 5 pm, excluding h y response service u e as Servi www.ibm.c df/wamom upport for	ce <sup>3</sup> nolidays, time pgrade icePac om/ xeu.pdf warranty

IBM®	FSB			Disk		Graphics adapter	Slots x F	irewire F/I	3	Available
Type-model Processor GHz <sup>1</sup>	MHz	Memory	Disk and rpm	controllers	Optical	and memory	bays	USBF/R	Preload <sup>17</sup>	date
6220-20U Pentium®4 2.8	800	256MB	40.0GB <sup>2</sup> EIDE	7.2K EIDE	CD-ROM	Quadro4™ 280NVS 64MB	4x3	0/0/2/4	XP Pro	Aug 2003
6220-24U Pentium 4 2.8	800	512MB	80.0GB SATA	7.2K EIDE	CD-ROM	Quadro4 580XGL 64MB	4x3	0/0/2/4	XP Pro	Aug 2003
6220-40U Pentium 4 3.2	800	256MB	40.0GB EIDE 7	7.2K EIDE	CD-ROM	Quadro4 280NVS 64MB	4x3	0/0/2/4	XP Pro	Aug 2003
6220-44U Pentium 4 3.2	800	512MB	80.0GB SATA	7.2K EIDE	CD-ROM	Quadro4 580XGL 64MB	4x3	0/0/2/4	XP Pro	Aug 2003

Processor Proc. Upg/L2 cache Implementation	Intel® Pentium 4 at 2.8 or 3.2GHz with 800MHz frontside bus (FSB) / All support Hyper-Threading technology No SMP Support / 512KB std and max / at processor speed Motherboard contains one mPGA478B socket (processor/L2 cache in FC-PGA2), four DIMM sockets, one 8X AGP slot, ethernet controller, five total PCI slots (two PCI slots on extender board, some have SCSI controller)
Memory - std / max Memory - features	<b>256MB</b> or <b>512MB</b> std / 4GB <sup>13</sup> max / one slot used / three slots available / <b>PC2700</b> 333MHz unbuffered 184-pin ECC CL2.5 DDR-SDRAM UDIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / <b>Error Checking and Correcting (ECC)</b> DIMMs and memory controller
Graphics controller (one of following)	<ul> <li>NVIDIA Quadro4™ 280NVS (entry 3D) / (see IntelliStation Graphics sheet for specs)</li> <li>NVIDIA Quadro4 580XGL (entry 3D)</li> </ul>
IDE disk controller  Cables Disk - features	Four Ultra ATA ports / ATA-100 / integrated in I/O Controller Hub 5 / four 40-pin connectors on planar Two Serial ATA ports / ATA-150 / integrated in I/O Controller Hub 5 / two 7-pin connectors on planar EIDE models: Two EIDE cables (one 2-drop cable to CD-ROM, one 2-drop 40-pin EIDE cable or 7-pin SATA cable) Some: EIDE ATA-100 or SATA ATA-150 / 7200 rpm / 9.0 ms seek; All: S.M.A.R.T. <sup>5</sup>
Rack support Chipset	Not available Intel 875P chipset / 82875P MCH (Memory Controller Hub) for AGP 8X slot and ICH5 / I/O Controller Hub (ICH5) for PCI 2.2 bus (four slots and one Mini-PCI slot), ethernet, ATA-100 EIDE, USB, Low Pin Count Interface / SMC 47M102 Super I/O off LPC
Gigabit ethernet  Diskette drive Optical drive IEEE 1394 (FireWire) Audio Rear ports Front ports Systems mgmt	One gigabit 10/100/1000 ethernet controller / Intel Kenai II CSA / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI 2.2 32-bit 33MHz / full duplex / Wake on LAN® / Alert Standard Format 1.0 None (USB floppy optional) Ultra ATA / 48X/20X Max® CD-ROM )Not enabled (purchase of 3rd party mini-PCI card will enable ports) Soft audio AC '97 v2.2 interface via ICH4 (AD1885) / internal speaker (use of audio line out requires powered speakers) Four USB (Ver 2.0), two 9-pin serial, parallel, keyboard, mouse, ethernet, audio line in, audio line out, mic in / 6-pin 1394 Two USB (Ver 2.0), audio line out (stereo), mic in / 4-pin 1394 FireWire Monitoring and alerting of thermal, fans, and voltage faults / Winbond® W83791D
Keyboard / mouse Cooling fans Power supply	IBM 104-key keyboard (6-pin PS/2) / IBM three button mouse (6-pin PS/2 conn) Two or three variable speed fans (pwr supply, rear, processor) / not redundant or hot-swap / third fan operates based on heat 200 watts / universal / auto sensing / built-in overload and surge protection

#### Desktop Stealth black 2 Optical 3 \_\_\_\_

Bay 15.25", HH 1.6", access. optical Bay @3.5", SL 1", no access, disk Bay @3.5", SL 1", no access, open

Slot 1: Half-height, 32-bit 33MHz, PCI 2.2 (5v) Slot 2: Half-height, 32-bit 33MHz, PCI 2.2 (5v) Slot 3: Half-height, 32-bit 33MHz, PCI 2.2 (5v) Slot 4: short, AGP 8X (1.5v)

- used by std AGP graphics adapter

**Options and Accessories** 256MB PC2700 CL2.5 ECC DDR-SDRAM 512MB PC2700 CL2.5 ECC DDR-SDRAM 06P4053 06P4054 1GB PC2700 CL2.5 ECC DDR-SDRAM 06P4055 IBM USB Portable Diskette Drive 05K9276 IBM 40GB 7.2K-rpm EIDE ATA-100 HDD IBM 80GB 7.2K-rpm EIDE ATA-100 HDD 22P7157 09N4226 IBM 120GB 7.2K-rpm EIDE ATA-100 HDD IBM 80GB S-ATA 7.2K-RPM HDD IBM 160GB S-ATA 7.2K-RPM HDD 09N4231 09N4253 09N4254 IBM ThinkVision L200P 20.1inLCD Black A/D 6736-HB0 IBM T221 22.2inLCD Black Digital 9503-DG3 Other options at ibm.com/pc/us/accessories

#### Weight and Dimensions

⇒ H 4.1" x W 14.2" x D 16.2" ⇒ H 104mm x W 360mm x D 412mm 20.0 lb to 22.0 lb (9.07kg to 9.98kg)

 Maximum internal disk capacity<sup>13</sup>: EIDE: 240GB (2 disks x 120GB) SATA: 320GB (2 disks x 160GB)

Removable left side panel
Configuration/Setup Utility: F1 at startup

• Product Recovery Program: F11 at startup

Network Boot: F12 at startup

Adv Config Power Interface (ACPI) 1.0a

• DMI 2.2-compliant

#### **SECURITY**

 U-bolt anchoring feature (U-bolt is optional; supports optional padlock)

 Security slot (for attachment of optional cable lock such as Kensington cable lock)

Side cover key lock

• Cover tamper detect switch

 Secure fixed DASD Power-on password

Administrator password

 Keyboard/mouse password Boot sequence control

Boot without keyboard or mouse

Diskette boot inhibit and write-protect

Disable mouse

• Diskette, disk, serial port, parallel port I/O control

Secure access openings

VPD stored in EEPROM

• Write protection control for EEPROM

• IBM Security Solutions

# Preload with Windows XP Professional<sup>17</sup>

Microsoft® Windows® XP Professional Free license for Lotus® SmartSuite®

Free license for Lotus Notes® Client

♦ IBM IntelliStation Documentation CD

• Disk-to-Disk Recovery (in service partition)

#### LIMITED WARRANTY<sup>3</sup>

3 year parts and labor

International Warranty Service<sup>3</sup>

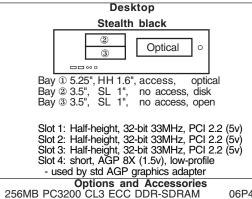
On site, 8 am through 5 pm, Mon through Fri excluding holidays, next business day response time

On site warranty service upgrade options<sup>7</sup> available as ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf

24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model Processor GHz¹		FSB MHz	Memory	Disk and rpm	Optical	Graphics adapter and memory	Slots x bays	Firewire F/I USBF/R	R Preload <sup>17</sup>	Available date
6220-50U Pentium 4 3.4	512KB 8	800	256MB	40.0GB EIDE 7.2K	CD-ROM	Quadro4 280NVS 64MB	4x3	0/0/2/4	XP Pro	Apr 2004
6220-54U Pentium 4 3.4	512KB 8	800	512MB	80.0GB SATA 7.2K	CD-ROM	Quadro4 580XGL 64MB	4x3	0/0/2/4	XP Pro	Apr 2004
6220-71U Pentium 4 3.4	1MB 8	800	512MB	80.0GB SATA 7.2K	CD-ROM	Quadro4 280NVS 64MB	4x3	0/0/2/4	RHEL3-WS	May 2004
6220-74U Pentium 4 3.4	1MB 8	800	512MB	80.0GB SATA 7.2K	CD-ROM	Quadro4 580XGL 64MB	4x3	0/0/2/4	XP Pro	May 2004

Processor Proc. Upg/L2 cache Implementation	Intel® Pentium 4 at 3.4GHz with 800MHz frontside bus (FSB) / All support Hyper-Threading technology PNO SMP Support / 512KB or 1MB std and max / at processor speed Motherboard contains one mPGA478B socket (processor/L2 cache in FC-PGA2), four DIMM sockets, one 8X AGP slot, ethernet controller, five total PCI slots (two PCI slots on extender board, some have SCSI controller)
Memory - std / max Memory - features	256MB or 512MB std / 4GB <sup>13</sup> max / one slot used / three slots available / PC2700 (50U) or PC3200 (54U, 7xU) unbuffered 184-pin ECC CL2.5 (50U) or CL3 (54U, 7xU) DDR-SDRAM UDIMMs / four DIMM slots on systemboard / DIMMs must be installed in matched pairs / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) DIMMs and memory controller
Graphics controller (one of following)	<ul> <li>NVIDIA Quadro4™ 280NVS (entry 3D) / (see IntelliStation Graphics sheet for specs)</li> <li>NVIDIA Quadro4 580XGL (entry 3D)</li> </ul>
IDE disk controller Cables Disk - features	Four Ultra ATA ports / ATA-100 / integrated in I/O Controller Hub 5 / four 40-pin connectors on planar Two Serial ATA ports / ATA-150 / integrated in I/O Controller Hub 5 / two 7-pin connectors on planar EIDE models: Two EIDE cables (one 2-drop cable to CD-ROM, one 2-drop 40-pin EIDE cable or 7-pin SATA cable) Some: EIDE ATA-100 or SATA ATA-150 / 7200 rpm / 9.0 ms seek; All: S.M.A.R.T. <sup>5</sup>
Rack support Chipset	Not available Intel 875P chipset / 82875P MCH (Memory Controller Hub) for AGP 8X slot and ICH5 / I/O Controller Hub (ICH5) for PCI 2.2 bus (four slots and one Mini-PCI slot), ethernet, ATA-100 EIDE, USB, Low Pin Count Interface / SMC 47M102 Super I/O off LPC
Gigabit ethernet  Diskette drive Optical drive IEEE 1394 (FireWire Audio Rear ports Front ports Systems mgmt	One gigabit 10/100/1000 ethernet controller / Intel Kenai II CSA / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI 2.2 32-bit 33MHz / full duplex / Wake on LAN® / Alert Standard Format 1.0 None (USB floppy optional) Ultra ATA / 48X/20X Max® CD-ROM )Not enabled / available via CTO Soft audio AC '97 v2.2 interface via ICH4 (AD1885) / internal speaker (use of audio line out requires powered speakers) Four USB (Ver 2.0), two 9-pin serial, parallel, keyboard, mouse, ethernet, audio line in, audio line out, mic in / 6-pin 1394 Two USB (Ver 2.0), audio line out (stereo), mic in / 4-pin 1394 FireWire Monitoring and alerting of thermal, fans, and voltage faults / Winbond® W83791D
Keyboard / mouse Cooling fans Power supply	IBM 104-key keyboard (6-pin PS/2) / IBM three button mouse (6-pin PS/2 conn) Two or three variable speed fans (pwr supply, rear, processor) / not redundant or hot-swap / third fan operates based on heat 200 watts / universal / auto sensing / built-in overload and surge protection



256MB PC3200 CL3 ECC DDR-SDRAM 512MB PC3200 CL3 ECC DDR-SDRAM 06P4049 06P4050 1GB PC3200 CL3 ECC DDR-SDRAM 06P4051 256MB PC2700 CL2.5 ECC DDR-SDRAM 512MB PC2700 CL2.5 ECC DDR-SDRAM 06P4053 06P4054 06P4055 1GB PC2700 CL2.5 ECC DDR-SDRAM IBM USB Portable Diskette Drive 05K9276 IBM 40GB 7.2K-rpm EIDE ATA-100 HDD 22P7157 IBM 80GB 7.2K-rpm EIDE ATA-100 HDD 09N4226
IBM 120GB 7.2K-rpm EIDE ATA-100 HDD 09N4231
IBM 80GB S-ATA 7.2K-RPM HDD 09N4253
IBM 160GB S-ATA 7.2K-RPM HDD 09N4254
IBM ThinkVision L200P 20.1inLCD Black A/D 6736-HB0 IBM T221 22.2inLCD Black Digital 9503-DG3 Other options at ibm.com/pc/us/accessories

#### Weight and Dimensions

- ⇒ H 4.1" x W 14.2" x D 16.2"
   ⇒ H 104mm x W 360mm x D 412mm
   20.0 lb to 22.0 lb (9.07kg to 9.98kg)
- Maximum internal disk capacity<sup>13</sup>: EIDE: 240GB (2 disks x 120GB) SATA: 320GB (2 disks x 160GB)
- Removable left side panel Configuration/Setup Utility: F1 at startup
- Product Recovery Program: F11 at
- Network Boot: F12 at startup
- Adv Config Power Interface (ACPI) 1.0a
- DMI 2.2-compliant

#### Preload with Red Hat Enterprise Linux 3 WS (32-bit) or Windows XP Professional (32-bit)17

Microsoft® Windows® XP Professional

- Free license for Lotus® SmartSuite®
- Free license for Lotus Notes® Client
- ♦ IBM IntelliStation Documentation CD
- Disk-to-Disk Recovery (in service) partition)

Red Hat Enterprise Linux 3 WS ♦ Device Drivers CD

#### **SECURITY**

- U-bolt anchoring feature (U-bolt is optional; supports optional padlock)
- Security slot (for attachment of optional cable lock such as Kensington cable lock)
- Side cover key lock
- Cover tamper detect switch
- Secure fixed DASD
- Power-on password
- Administrator password
- Keyboard/mouse password
- Boot sequence control
- Boot without keyboard or mouse
- Diskette boot inhibit and write-protect
- Disable mouse
- Diskette, disk, serial port, parallel port I/O control
- Secure access openings
- VPD stored in EEPROM
- Write protection control for EEPROM
- IBM Security Solutions

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am through 5 pm, Mon through Fri excluding holidays, next business day response time
- On site warranty service upgrade options<sup>7</sup> available as ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

= 71	Intellistation® M Pro (6225) - October 2004					xREF by eServer Field Skills and Education Team						
	IBM® Type-GAV-model Prod	essor & GHz <sup>1</sup>	L2 M	emory Dis	k & rpm	Disk controllers	Optical	Graphics ada		Slots Vire bays	x Preload	Available date
	6225-10y-10U Pentiu 6225-11y-11U Pentiu 6225-20y-20U Pentii 6225-22y-22U Pentii 6225-23y-23U Pentii 6225-25y-25U Pentii 6225-26y-26U Pentii 6225-32y-32U Pentii 6225-32y-35U Pentii 6225-35y-35U Pentii 6225-36y-36U Pentii	um 4 3.4GHz um 4 3.6GHz um 4 3.6GHz um 4 3.6GHz um 4 3.6GHz um 4 3.6GHz um 4 3.8GHz um 4 3.8GHz um 4 3.8GHz	1MB 5: 1MB 5: 1MB 5: 1MB 1: 1MB 1: 1MB 5: 1MB 5: 1MB 1:	12MB 730 12MB 800 12MB 730 GB 730 12MB 800 12MB 800 GB 730	GB 10K GB 7.2k GB 7.2k GB 10K GB 10K GB 7.2k GB 7.2k GB 10K	C Ultra320 C SATA C SATA Ultra320 C Ultra320 C SATA C SATA C SATA C Ultra320	CD-ROM CD-ROM CD-RW	Quadro® NVS 28 ATI FireGL™ V3 ATI FireGL V310 Quadro FX 1400 Quadro FX 3400 Quadro FX 3400 Quadro NVS 28 Quadro FX 1300 Quadro FX 3400 Quadro FX 3400 Quadro NVS 280	100 128MB 1 00 128MB 1 0 128MB 1 0 256MB 1 0 256MB 1 0 64MB 1 0 128MB 1 0 256MB 1	394 4x5 394 4x5 394 4x5 394 4x5 394 4x5 394 4x5 394 4x5 394 4x5 394 4x5 394 4x5	XP Pro XP Pro XP Pro XP Pro XP Pro XP Pro RH 3 XP Pro XP Pro RH 3	Dec 2004 Dec 2004 Dec 2004 Dec 2004 Dec 2004 Dec 2004 Dec 2004 Jan 2004 Jan 2004
	Positioning Processor L2 cache Processor upgrade Implementation	1 Intel Pent (EM64T) 1M Single Prod Systemboar	iúm 4 at IB standa cessor, n d contain	3.4, 3.6G ard and m no upgrade ns one Inte	Hz & 3. aximum el 604-p	.8GHz with 8 / at process	800MHz fror or speed A2 ZIF sock	ry 64 Technology ttside bus (FSB) et, four DIMM sle ernet	) & Extende		•	
	Memory - std / max					slots used / ots on systen		railable / PC3200	400MHz reg	istered E	CC DDR2	2-SDRAM
	Graphics controller (one of following)	<ul><li>NVIDIA Q</li><li>ATI FireG</li><li>NVIDIA Q</li></ul>	uadro N\ L V3100 : uadro FX	VS 280 20 3D 128ME ( 1300 3D	0 64MB 3 PCI E: 128MB	PCI Expres	s x16 s x16	)				
	SATA controller SCSI controller SCSI channels and cables Ports/Cables Disk - features	SCSI model mini-PCI ad One 16-bit of systemboard All models: optical)	ls: <b>PCI-X</b> lapter channel (d d to inter Four SAT	Ultra320 one interninal disks TA ports o	/ single al or ex bays n plana	ternal) / Inter r SCSI mode	Itra320 SCS rnal channel els: One SCS	onnectors on pla I controller (LVI : one 4-drop 16-t SI cable (listed ab 73.0GB Ultra320	D 320MB/ser bit 68-pin LV bove), <i>ALL:</i> (	D SCSI one 2-dro	cable from	able (to
	Mechanical Chipset	4 x 5 Mini-to Intel 925X cl 33MHz PCI s	hipset / 92	25X MCH	(Memory	Controller Hu	ub) for PCI Ex 2.0), Low Pin	xpress x16 (video), Count Interface / N	Broadcom, I	CH6R / IC Super I/O	CH6R for tw	vo 32-bit/ terface
	Gigabit Ethernet  Diskette / Optical drives IEEE 1394 (FireWire) Audio Rear ports Front ports Systems mgmt	chip on plan Diskette: no DVD/CD RW FireWire on AC - 97 Aud Six USB (Ve Two USB (V	gabit 10/100/1000 Ethernet controller / Broadcom BCM5721 / full Gigabit Ethernet MAC and PHY layer function planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port e: none Optical: One of the following: 48X-20X® CD-ROM, 48X/32X/48X Max® CD-RW or IBM Multi-Burner PluD RW e on planar / 1394a, 400Mbps, 6-pin port on rear, 4-pin port on front Audio, ADI1981B via ICH6r / internal speaker (use of audio line out requires powered speakers) B (Ver 2.0), two 9-pin serial, parallel, keyboard, mouse, Ethernet, audio line in, audio line out, mic in / 6-pin 1394a SB (Ver 2.0), audio line out (stereo), mic in / 4-pin 1394 ring and alerting of thermal, fans, and voltage faults / Winbond® W791D					port er Plus				
	Keyboard / mouse Cooling fans Power supply	Two variable	e speed fa	ans (1 Fro	nt, 1 PS	BM 3-button ( 6) / not redur uilt-in overloa	ndant or hot-s		• Security s	ot (for att		
	② Bay © Bay © Bay ©	① 5.25", HH 1 ② 5.25", HH 1 ③ 3.5", SL 1 ④ 3.5", SL 1 ⑤ 3.5", SL 1	.6", access ", access ", access	s, open s, open s, open	( ( (	Two front s Handle grip H 19.4" x V H 492mm S 23 lb to 30	o on top W 6.9" x D 17 x W 175mm	7.7" x D 450mm	Cover lock cable     Cover tam     Secure fix     Power-on     Administra     Boot sequ     Boot without	cable with per detected DASD password tor passivence con	padlock of switch word trol	or laptop
	Slot 1 Slot 2 Slot 3	: fullsize, PCI :: fullsize, PCI :: fullsize, 32-I :: fullsize, 32-I	l Express bit 33MHz	x16 (video , PCI (5v)	)	SATA: 7500 • Removable • BIOS Setup	GB (3 disks x GB (3 disks x left side panel Utility via F1 nfiguration Uti CTRL+C	146GB) 250GB) at startup lity near startup	Diskette be     Disable me     Diskette, cli/O control     Secure ace     VPD store     Write prote     IBM Secure	oot inhibit buse isk, serial cess open d in EEPF ection con	and write- port, para lings ROM trol for EE	protect Illel port
	512MB PC3200 CL3 1GB PC3200 CL3 E 2GB PC3200 CL3 E ServeRAID-7t SATA IBM 73.4GB 10K rpr IBM 146GB 10K rpr IBM 160GB 7.2K rpr IBM ThinkVision L20 IBM T221 22.2in LCI Other options at <b>ibi</b>	CC DDR2-SE CC DDR2-SE Controller n Ultra320 SC n Ultra320 SC n SATA-150 F 0P 20.1in LCI D Business BI	DRAM DRAM OSI HDD SI HDD HDD D Black A/ lack Digital	73P: 74P: 71P: 32P: 32P: 09N /D 6736 I 9503	3525 3526 8651 0724 0725 4254 16-HB0 3-DG5	<ul> <li>Adv Config</li> <li>DMI 2.2-con</li> </ul> Preload with Microsoft® Wi	npliant  Windows X  Indows® XP F e for Lotus® S e for Lotus N yers and IBM s CD Station Docum	SmartSuite® otes® Client Enhanced	<ul> <li>⇒ 3 year pa</li> <li>⇒ Internation</li> <li>⇒ On site,</li> <li>Mon throught</li> <li>⇒ On site</li> <li>⇒ options</li> <li>⇒ services</li> <li>⇒ 24x7<sup>14</sup> to</li> </ul>	rts and la onal Warra B am throe ugh Fri e ness day varranty available at http://w /us/its/pd	anty Servi ugh 5 pm, xcluding h response	ce <sup>3</sup> nolidays, time pgrade icePac oom/ xeu.pdf warranty



See footnotes for important warranty information US models announced July 29, 2003

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Disk					
6230-520 Pentium 4 3.4 800 15/M8 60.063 SATA 7.2K SATAEIDE CD-RW Quadro FX 100 18/MB 677 334 DSPX 72 PPO Apr 2004 SSP30-520 PPONTUM 4.3 800 15/MB 66 36.458 US20 10K Ultras20, EIDE CD-RW Quadro FX 100 18/MB 677 1394 XP PPO Apr 2004 CS20-610 Pentium 4.3 8 800 15/MB 66,668 US20 10K Ultras20, EIDE CD-RW Quadro FX 300 25/MB 67 1394 XP PPO Apr 2004 CS20-610 Pentium 4.3 8 800 15/MB 66,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 25/MB 67 1394 XP PPO Apr 2004 CS20-610 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 15/MB 67 1394 XP PPO Apr 2004 CS20-610 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 15/MB 67 1394 XP PPO Apr 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 15/MB 67 1394 XP PPO Apr 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 15/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 15/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 15/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 15/MB 60,068 SATA 7.2K SATAEIDE CD-RW Quadro FX 300 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 8.7 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 84 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 84 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3 800 16/MB 67 1394 XP PPO May 2004 CS20-720 Pentium 4.3					
Proc. Upg/L2 cache No SMP Support / S12KB (Sul) or 1MB (skU, 7xU) std and max / al processor speed moderntoand contains one mepGA47BB sock (processor) 2 cache in FC-PGA20, four DIMM sockets, one 8X AGP slot, implementation of Motherboard contains one mepGA47BB sock (processor) 2 cache in FC-PGA20, four DIMM sockets, one 8X AGP slot, implementation of the state of the	6230-52U Pentium 6230-55U Pentium 6230-56U Pentium 6230-58U Pentium 6230-61U Pentium 6230-65U Pentium 6230-72U Pentium 6230-75U Pentium	4 3.4 800 512MB 80.0GB SA 4 3.4 800 1GB 36.4GB U3 4 3.4 800 1GB 36.4GB U3 4 3.4 800 512MB 36.4GB U3 4 3.2 800 512MB 80.0GB SA 4 3.2 800 1GB 160GB SA 4 3.4 800 1GB 36.4GB U3 4 3.4 800 1GB 36.4GB U3	ATA 7.2K SATA, EID 320 10K Ultra320, EI 320 10K Ultra320, EI 320 10K Ultra320, EI 320 10K Ultra320, EI 37A 7.2K SATA, EID	E CD-RW Quadro FX 50 DE CD-RW Quadro FX 11 DE CD-RW Quadro FX 11 DE CD-RW Quadro FX 30 DE CD-RW Quadro FX 30 E CD-RW Quadro FX 30 E CD-RW Quadro FX 11 E CD-RW Quadro FX 50 DE CD-RW Quadro FX 50 DE CD-RW Quadro FX 11	00 128MB       6x7       XP Pro       Apr 2004         00 128MB       6x7 1394       DOS2K       Apr 2004         00 128MB       6x7 1394       XP Pro       Apr 2004         4GL 128MB       6x7 1394       XP Pro       Apr 2004         400 256MB       6x7 1394       XP Pro       Apr 2004         400 256MB       6x7       XP Pro       May 2004         400 128MB       6x7       XP Pro       May 2004         400 128MB       6x7       XP Pro       May 2004         400 128MB       6x7       1394       RHEL3       May 2004
Memoriy - features DDR-SDRAM UDIMMs / four DIMM gold-connector sots on systemboard / DIMMs must be installed in matched pairs (a bank) / 2-way memory interleave / ducid channel / Error Checking and Correcting (ECO) DIMMs and more your interleave / ducid channel / Error Checking and Correcting (ECO) DIMMs and more your interleave / ducid channel / Error (long of following)   NVIDIA Quadrof PX 3000 (extreme 3D)   NVIDIA Quadrof PX 3000 (extreme 3D)	Proc. Upg/L2 cache Implementation	e No SMP Support / 512KB (5: Motherboard contains one mP ethernet controller, five total P	xU) <b>or 1MB</b> (6xU, 7xU) PGA478B socket (proce CI slots (two PCI slots	l) std and max / at process essor/L2 cache in FC-PGA on extender board, some l	or speed 2), four DIMM sockets, one 8X AGP slot, have SCSI controller)
(one of following) • NVIDIA Quadro 4 80XGL (advanced 3D) • NVIDIA Quadro FX 1100 (advanced 3D) • NVIDIA Quadro FX 1000 (advanced 3D) • SCSI models: One 4-drop 16-bit 88-pin LVD SCSI (adba from extender board /no extender b		DDR-SDRAM UDIMMs / four DI	MM gold-connector slots	on systemboard / DIMMs mi	ust be installed in matched pairs [a bank] / 2-
Two Serial ATA ports / ATA-150 / Integrated in I/O Controller Hub 5 / two 7-pin connectors on planar / 20-bit 33MHz PCI 2.2 / one 68-pin internal connector on extender board / 32-bit 33MHz PCI 2.2 / one 68-pin internal connector on extender board / no external SCSI connector / one 16-bit channel (internal only)  Cables  EIDE models: Two EIDE actiles (one 2-drop cable to CD-ROM, one 2-drop 40-pin EIDE cable for 7-pin SATA cable)  ScSI models: One 4-drop 16-bit 68-pin LVD SCSI cable from extender to int disks bays, one 2-drop EIDE cable (to optical)  Some: EIDE ATA-100 or SATA ATA-150 / 7200 pm / 9.0 ms seek; Some: Ultra320 SCSI / 10/fem / 4.7 ms; Altr. SM.A.R.T.*  4UP rack mount support via lower-brack kit option - track kit o		<ul> <li>NVIDIA Quadro 980XGL</li> <li>NVIDIA Quadro FX 500 (en</li> <li>NVIDIA Quadro FX 1100 (a</li> </ul>	(advanced 3D) (advanced 3D) (advanced 3D)	e IntelliStation Graphics she	eet for specs)
Audio   Gigabit ethernet   At   Audio   Chip   For   Chipsel   At   Audio   Chip   Chipsel   At   Chipsel   At   Chipsel   Audio   Chipsel   At   Chipsel   Chipsel   At   Chipsel   Chipsel   At   Chipsel	SCSI disk controlle	Two Serial ATA ports / ATA-1 er SCSI models: Adaptec® AIC- 32-bit 33MHz P one 16-bit char EIDE models: Two EIDE cable SCSI models: One 4-drop 16-	50 / integrated in I/O or 7901 / single channel CI 2.2 / one 68-pin intennel (internal only) as (one 2-drop cable to bit 68-pin LVD SCSI cab	Controller Hub 5 / two 7-pir Ultra320 SCSI controller rnal connector on extender CD-ROM, one 2-drop 40-pinble from extender to int disk	n connectors on planar (LVD 320MB/sec) / on extender board / board / no external SCSI connector / in EIDE cable or 7-pin SATA cable) ks bays, one 2-drop EIDE cable (to optical)
Gigabit ethernet  One gigabit 10/100/1000 ethernet controller / Intel Kenai II CSA / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI 2.2 32-bit 33MHz / full duplex / Wake on LAN*  3.5* 1.44MB diskette drive One of following: 48X/24X/48X Max**3 CD-ROM IEEE 1394 (FireWire) Some: FireWire controller on planar / 1394A, 400Mbps, 6-pin port on rear, 4-pin port on front. CTO availability for 1394 on all models.  Soft audio AC '97 v2.2 interface via ICH5 / internal speaker (use of audio line out requires powered speakers) Rear ports Front ports Front ports Front ports Gooling fans Two USB (Ver 2.0), audio line out (stereo), mic in / some: 4-pin 1394 FireWire Systems mgmt Mointoring and alerting of thermal, fans, and voltage faults / Winbond* W83791D  Keyboard / mouse Cooling fans Three variable speed fans (pwr supply, ado watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  340 watts / universal / auto sensing / built-in overload and surge protection  341 Handle gri	Rack support	4U <sup>17</sup> rack mount support via to Intel 875P chipset / 82875P N 2.2 bus (six slots and one Min	ower-to-rack kit option MCH (Memory Controll i-PCI slot), SCSI (some	er Hub) for AGP 8X slot an	nd ICH5 / I/O Controller Hub (ICH5) for PCI
Keyboard / mouse [BM 104-key keyboard (6-pin PS/2) / IBM three button mouse (6-pin PS/2 conn) root redundant or hot-swap 340 watts / universal / auto sensing / built-in overload and surge protection    Optical	Diskette drive Optical drive IEEE 1394 (FireWire Audio Rear ports Front ports	chip on planar / PCI 2.2 32-bit 3.5" 1.44MB diskette drive One of following: 48X/24X/48' 9) Some: FireWire controller on plar Soft audio AC '97 v2.2 interfa Four USB (Ver 2.0), two 9-pin se Two USB (Ver 2.0), audio line	t 33MHz / full duplex / X Max <sup>6,19</sup> CD-RW, or 4 nar / 1394A, 400Mbps, 6 ce via ICH5 / internal rial, parallel, keyboard, m e out (stereo), mic in /	Wake on LAN®  8X/20X Max <sup>6</sup> CD-ROM  -pin port on rear, 4-pin port or speaker (use of audio line nouse, ethernet, audio line in, some: 4-pin 1394 FireWire	n front. CTO availability for 1394 on all models. out requires powered speakers) audio line out, mic in / <i>some:</i> 6-pin 1394
	Keyboard / mouse Cooling fans Power supply  Optical Bay	IBM 104-key keyboard (6-pin I Three variable speed fans (pwr: 340 watts / universal / auto se / ① 5.25", HH 1.6", access, opt / ② 5.25", HH 1.6", access, ope / ③ 3.5", SL 1", access, ope / ③ 3.5", SL 1", no access, dis / ⑥ 3.5", SL 1", no access, ope / ⑦ 3.5", SL 1", no access, ope / ② 3.5", SL 1", acces, ope / ② 3.5", SL 1", no access, ope / ② 3.5	PS/2) / IBM three butto supply, rear, processor) nsing / built-in overloar ical en cates out of the processor of the processo	on mouse (6-pin PS/2 conn)/ not redundant or hot-swap d and surge protection or disk bays 5, 6, and 7 of chassis abilizing feet on top W 6.5" x D 19.0" W 165mm x D 483mm o (16.3kg to 19.1kg) ternal disk capacity <sup>13</sup> : GB (4 disks x 146.8GB) B (3 disks x 120GB) B (3 disks x 120GB) B (2 disks x 160GB) left side panel n/Setup Utility: F1 at startup overy Program: F11 at Utility: CTRL+A at startup ot: F12 at startup overy Program: F10 at startup ot: F12 at startup overy Program: F10 at startup ot: F12 at startup overy Program: F10 at startup ot: F12 at startup overy Program: F10 at startup ot: F10 at startup overy Program: F10 at sta	U-bolt anchoring feature (U-bolt is optional; supports optional padlock)     Security slot (for attachment of optional cable lock such as Kensington cable lock)     Side cover key lock     Cover tamper detect switch     Secure fixed DASD     Power-on password     Administrator password     Keyboard/mouse password     Boot sequence control     Boot without keyboard or mouse     Diskette boot inhibit and write-protect     Disable mouse     Diskette, disk, serial port, parallel port I/O control     Secure access openings     VPD stored in EEPROM     Write protection control for EEPROM     IBM Security Solutions  LIMITED WARRANTY³     З year parts and labor     International Warranty Service³     On site, 8 am through 5 pm, Mon through Fri excluding holidays, next business day response time     On site warranty service upgrade

IDM#®	F0D	B' I	0 11 1 1	01.1.	
IBM® Type-model Process	FSB or GHz¹ MHz Memory   Disk and rpr	Disk controllers Optical	Graphics adapter and memory	Slots x Avai bays FireWire Preload <sup>17</sup>	ilable date
		7.2K Ultra320, EIDE CD Q 0K Ultra320, EIDE Combo Q	uadro4 280NVS 64MB uadro4 980XGL 128MB	2MB6x6         XP Pro Dec           6x6         XP Pro Dec           6x6         1394         XP Pro Dec           6x6         XP Pro Dec         XP Pro Dec           6x6         1394         XP Pro Dec           6x6         1394         XP Pro Dec	2002 2002 2002 2002
Processor L2 cache Processor upgrade Implementation	1 or 2 x Intel® Xeon at 2.4, 2.67, or 512KB std and max / at processor 2-way SMP / up to two Xeon Processor Systemboard contains two Intel 60 one Mini PCI, one AGP), and integ	speed ssors (same speed/cache size 4-pin micro-PGA2 ZIF sockets,	)	slots (one PCI 2.2, four PCI-X	(,
Memory - std / max Memory - features	<b>512MB</b> or <b>1GB</b> std / 8GB <sup>13</sup> max / SDRAM DIMMs / four DIMM gold 2-way memory interleave / dual c (corrects 1, 2, 3, or 4-bit errors or	connector slots on systemboar nannel / <b>Error Checking and</b>	d / DIMMs must be insta Correcting (ECC) via 1	alled in matched pairs [a ban <mark>6-bit Checksum Chipkill</mark> ™	
Graphics controller (one of following)	Matrox® Millennium G450 DVI-I dual RAMDAC [360/232MHz] / du     NVIDIA™ Quadro4 280NVS (hig 350MHz RAMDACs / dual head: 3048x1536x16M eacl all head: 2048x1536x16M eacl 3DLabs Wildcat4™ 7110 (extrem 128MB texture buffer) / dual RAM two DVI-I connectors (ships with two DVI-I was provided to the statement of	al head support / one DVI-I conn I-perf 2D) / AGP 8X adapter / NV 048x1536x16M each monitor / I Inced 3D) / AGP 8X adapter / 12 I monitor / two DVI-I connectors e 3D) / AGP 8X Pro 50 adapter / DAC [320/280MHz] / dual head	ector (ships with one cabl V18LT 275MHz GPU / 64 LFH60 connector for std c 28MB 325MHz DDR-SDI s (ships with two DVI-I to / 256MB total DDR-SDR/ support (up to two digital c	e with two DB-15 analog conns MB 200MHz DDR-SDRAM / d able with two DB-15 analog RAM / dual 350MHz RAMDAC DB-15 dongles) vM (128MB frame buffer, or analog monitors) /	lual
IDE disk controller SCSI disk controller SCSI channels and cables Cables Disk - features	Enhanced IDE busmaster / ATA-11 LSI Logic® 53C1030 / dual chann supports RAID-1 mirroring (Embe Two 16-bit channels (one internal asystemboard to internal disks bays systemboard to rear external 68-pi EIDE models: Two EIDE cables (SCSI models: One or two SCSI CS Some: 40.0GB EIDE / ATA-100 / 7	el Ultra320 SCSI controller (L dded Mirroring) Ind one external) / Internal char s; External channel: Models 29U n connector (cable available as ine 2-drop cable to CD-ROM, o bles (listed above), one 2-drop	VD 320MB/sec) / on plar nnel: one 3-drop 16-bit 68 J/37U have one 1-drop 1 option part number 24P7 nne 2-drop cable to EIDE EIDE cable (to optical)	nar / 64-bit 100MHz PCI-X / B-pin LVD SCSI cable from 6-bit 68-pin LVD SCSI cable f 929) disk)	
Rack support Chipset	4U <sup>4</sup> rack mount support via tower Intel E7505 chipset / E7505 MCH for slots 2 and 3 and ethernet contr (one slot and one Mini PCI slot), AT	to-rack kit option Memory Controller Hub) for AG oller: Bus B for slots 4 and 5 and	iP 8X slot, P64H2, ICH4 / I SCSI controller) / I/O Co	P64H2 for two PCI-X buses (Entroller Hub (ICH4) for PCI 2.2	Bus A
Gigabit ethernet  Diskette drive Optical drive IEEE 1394 (FireWire Audio Rear ports Front ports Systems mgmt	One gigabit 10/100/1000 ethernet of chip on planar / PCI-X 64-bit 100Ml 3.5" 1.44MB diskette drive One of following: 48X-20X° CD-RCe)Some: FireWire controller in Mini Soft audio AC '97 v2.2 interface via Two USB (Ver 2.0), two 9-pin seria Two USB (Ver 2.0), audio line out Monitoring and alerting of thermal,	Iz / full duplex / Wake on LAN® / M, 32X/10X/40X/16X Max <sup>6,19</sup> C PCI slot / 1394A, 400Mbps, 6- .ICH4 (AD1885) / internal spea I, parallel, keyboard, mouse, et stereo), mic in / <i>some:</i> 4-pin 13	Alert Standard Format 1 D-RW/DVD-ROM Combo pin port on rear, 4-pin p ker (use of audio line out hernet, audio line in, aud 94 FireWire and® W791D	.0 / one rear RJ-45 port o, or 40X/24X/40X Max <sup>6</sup> CD-R ort on front, no cables included requires powered speakers) io line out, mic in / some: 6-pin SECURITY	ded
Keyboard / mouse Cooling fans Power supply	IBM 104-key keyboard (6-pin PS/2) Three variable speed fans (power s 425 watts / universal / auto sensing	/ IBM three button mouse (6-pir upply, two in rear) / not redundar	n PS/2 conn) nt or hot-swap tection • U-bolt option • Securi cable l	anchoring feature (U-bolt is al; supports optional padlock) ty slot (for attachment of optior ock such as Kensington cable key lock	
Optical Bay Bay Bay Bay Gliskette Bay	© 5.25", HH 1.6", access, optical © 5.25", HH 1.6", access, open (© 3.55", SL 1", access, diskett (© 3.5", SL 1", no access, disk (© 3.5", SL 1", no access, open (© 3.5", SL 1"), no access, open (© 3.5", SL 1", no access, open (© 3.5", SL 1"), no access, disk ett. (© 3.5", SL 1"), no access, open (© 3.5", SL 1"), no access, disk ett. (© 3.	⇒ Handle grip on top ⇒ H 17.375" x W 6.5" x D 1 ⇒ H 441mm x W 165mm x ⇒ 36 lb to 45.8 lb (16.3kg to • Maximum internal disk of SCSI: 438GB (3 disks x 1 EIDE: 240GB (2 disks x • Removable left side pane • BIOS Setup Utility via F1 • LSI Configuration Utility r pressing CTRL+C • Product Recovery Progra startup • Adv Config Power Interfa • DMI 2.2-compliant  Preload with Windows XF Microsoft® Windows® XP P • Free license for Lotus® S • Free license for Lotus® S • Device Drivers and IBM E Diagnostics CD  ♦ IBM IntelliStation Docume	Secure Power Admin D 492mm D 20.8kg) D 20.8kg) D 20.8kg) D 20.8kg) D 20.8kg	tamper detect switch e fixed DASD e fixed DASD -on password istrator password ard/mouse password equence control rithout keyboard or mouse te boot inhibit and write-protect e mouse te, disk, serial port, parallel por trol e access openings tored in EEPROM protection control for EEPROM ecurity Solutions  LIMITED WARRANTY3  ar parts and labor reational Warranty Service3 rite, 8 am through 5 pm, through Fri excluding holiday business day response time site warranty service upgrade ons7 available as ServicePac ons6 at http://www.ibm.com/ ices/us/its/pdf/wamomxeu.pc 14 toll-free support for warrar	ys, ec

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		`		
	BM® Type-model Processo	FSB or GHz <sup>1</sup> MHz Memory Disk and rpm		phics adapter Slots x Available bays FireWire Preload <sup>17</sup> date
6 6 6 6 7 7 8	6221-42U 1 x Xeon 6221-46U 1 x Xeon 6221-47U 1 x Xeon 6221-48U 1 x Xeon 6221-49U 2 x Xeon 6221-4PU 1 x Xeon Processor 2 cache	3.06 533 512MB 40.0GB EIDE 7.2H 3.06 533 512MB 40.0GB EIDE 7.2H 3.06 533 1GB 36.4GB U320 10k 3.06 533 512MB (none) open-bay 1 or 2 x Intel® Xeon at 2.8B or 3.06 512KB std and max / at processor spe	CUltra320, EIDE CD Quadro4 2 CUltra320, EIDE Combo Quadro4 9 CUltra320, EIDE CD-RW Wildcat4 7 CUltra320, EIDE CD-RW Quadro FX CUltra320, EIDE DVD Quadro4 2 Ultra320, EIDE None Quadro4 2 GHz with 533MHz frontside bus (led	80XGL 128MB       6x6       1394       XP Pro Apr 2003         1 G450 DVI-I 32MB6x6       XP Pro Apr 2003         80NVS 64MB       6x6       XP Pro Apr 2003         180XGL 128MB       6x6       1394       XP Pro Apr 2003         110 256MB       6x6       1394       XP Pro Apr 2003         1 1000 128MB       6x6       1394       XP Pro Apr 2003         80NVS 64MB       6x6       1394       XP Pro Apr 2003         80NVS 64MB       6x6       1394       XP Pro Apr 2003         80NVS 64MB       6x6       DOS lic Apr 2003
-	mplementation  Memory - std / max	one Mini PCI, one 8X AGP), and inte-	in micro-PGA2 ZIF sockets, four DIM grated SCSI and ethernet	M slots, seven slots (one PCI 2.2, four PCI-X, 2100 266MHz registered 184-pin ECC DDR-
	Memory - features		nector slots on systemboard / DIMN I / Error Checking and Correcting (I	Is must be installed in matched pairs [a bank] / ECC) via 16-bit Checksum Chipkill™
_	Graphics controller (one of following)	RAMDACs / dual head: 2048x1536x  • 3DLabs Wildcat4™ 7110 (extreme 128MB texture buffer) / dual RAMDAC two DVI-I connectors (ships with two	performance 2D) (see 6221-Novembed 3D) / AGP 8X adapter / 128MB 16M each monitor / two DVI-I conne 3D) / AGP 8X adapter / 256MB tota C [320/280MHz] / dual head support (UDVI-I to analog DB-15 adapters for ad 3D) / AGP 8X adapter / 128MB 80	per 2002 sheet for specs) 325MHz DDR-SDRAM / dual 350MHz ectors (ships with two DVI-I to DB-15 dongles) I DDR-SDRAM (128MB frame buffer, up to two digital or analog monitors) / analog monitor attachment) IOMhz DDR-SDRAM / dual 400Mhz RAMDACs /
9	DE disk controller SCSI disk controller SCSI channels and cables Cables Disk - features	supports RAID-1 mirroring (Embedd Two 16-bit channels (one internal ansystemboard to internal disks bays; Esystemboard to rear external 68-pin co EIDE models: Two EIDE cables (one SCSI models: One or two SCSI cable	Ultra320 SCSI controller (LVD 32 ded Mirroring) d one external) / Internal channel: o xternal channel: Models 29U/37U havinnector (cable available as option pa 2-drop cable to CD-ROM, one 2-drop s (listed above), one 2-drop EIDE cal	20MB/sec) / on planar / 64-bit 100MHz PCI-X / one 3-drop 16-bit 68-pin LVD SCSI cable from ve one 1-drop 16-bit 68-pin LVD SCSI cable from or cable to EIDE disk)
-	Rack support Chipset	A for slots 2 and 3 and ethernet controlle (one slot and one Mini PCI slot), ATA-100	nory Controller Hub) for AGP 8X slot, Porr; Bus B for slots 4 and 5 and SCSI cord EIDE, USB, Low Pin Count Interface	64H2, ICH4 / P64H2 for two 64-bit PCI-X buses (Bus htroller) / I/O Controller Hub (ICH4) for PCI 2.2 bus 'NS PC87366 Super I/O off LPC interface
II H F	Gigabit ethernet  Diskette / Optical drives EEE 1394(FireWire) Audio Rear ports Front ports Systems mgmt	chip on planar / PCI-X 64-bit 100MHz / 3.5" 1.44MB diskette drive and one c Combo, 48X/24X/48X Max <sup>6</sup> CD-RW o <i>Some:</i> FireWire controller in Mini PCI Soft audio AC '97 v2.2 interface via IC	full duplex / Wake on LAN® / Alert Sta of the following: 48X-20X° CD-ROM, or 16X Max® DVD-ROM slot / 1394A, 400Mbps, 6-pin port of H4 (AD1885) / internal speaker (use arallel, keyboard, mouse, ethernet, au dereo), mic in / some: 4-pin 1394 Fir	48X/24X/48X/16X Max <sup>6,19</sup> CD-RW/DVD-ROM on rear, 4-pin port on front of audio line out requires powered speakers) dio line in, audio line out, mic in / some: 6-pin 1394 reWire SECURITY
(	Keyboard / mouse Cooling fans Power supply	IBM 104-key keyboard (6-pin PS/2) / IB Three variable speed fans (power supp 425 watts / universal / auto sensing / bu	ly, two in rear) / not redundant or hot-s	optional; supports optional padlock)  Security slot (for attachment of optional cable lock such as Kensington cable lock)
	Optical Bay	© 5.25", HH 1.6", access, optical open (2) 5.25", HH 1.6", access, open (3) 3.5", SL 1", access, diskette (4) 3.5", SL 1", no access, disk (5) 3.5", SL 1", no access, open (6) 3.5", SL 1", no access, open (7) 4.5", SL 1", no access, open (8) 3.5", SL 1", no access, open (8) 4.5", SL 1", no access, open (8) 5.5", SL 1", no access, open (8) 4.5", NIIII SILE, CI S. 110, NIIII SILE, SL 110, NIIII	<ul> <li>Metal cage for disk bays 4,5,6 rotates out of chassis</li> <li>Two front stabilizing feet</li> <li>Handle grip on top</li> <li>H 17.375" x W 6.5" x D 19.375"</li> <li>H 441mm x W 165mm x D 492mm</li> <li>36 lb to 45.8 lb (16.3kg to 20.8kg)</li> <li>Maximum internal disk capacity¹³: SCSI: 438GB (3 disks x 146GB)</li> <li>Removable left side panel</li> <li>BIOS Setup Utility via F1 at startup</li> <li>LSI Configuration Utility near startup ressing CTRL+C</li> <li>Product Recovery Program via F1 startup</li> <li>Adv Config Power Interface (ACPI</li> <li>DMI 2.2-compliant</li> <li>Preload with Windows XP Profess</li> <li>Microsoft® Windows® XP Professiona</li> <li>Free license for Lotus® SmartSuite</li> </ul>	Boot sequence control Boot without keyboard or mouse Diskette boot inhibit and write-protect Disable mouse Diskette, disk, serial port, parallel port I/O control Secure access openings VPD stored in EEPROM Write protection control for EEPROM IBM Security Solutions  LIMITED WARRANTY  3 year parts and labor International Warranty Service On site, 8 am through 5 pm, Mon through Fri excluding holidays,
	IBM 120GB 7.2K IBM ThinkVision L IBM T221 22.2inL0 IBM 4Ux20D Tow	m Ultra320 SCSI HDD 32P0725 rpm ATA-100 EIDE HDD 09N4231 200P 20.1inLCD Black A/D 6736-HB0 CD Black Digital 9503-DG3 rer-to-Rack Conversion Kit 09N4300 ibm.com/pc/us/accessories		options <sup>7</sup> available as ServicePac options at http://www.ibm.com/

	ion 2 Pro (6221) - Octob	el 2005 AREF	by eServer Field Skills Enablement Team
IBM® Type-model Processo	FSB or GHz <sup>1</sup> MHz Memory Disk and rpm	Disk Graphics controllers Optical and me	
6221-52U 1 x Xeor 6221-53U 1 x Xeor 6221-56U 1 x Xeor 6221-57U 1 x Xeor 6221-58U 2 x Xeor 6221-59U 1 x Xeor	n <sup>TM</sup> 3.2 533 512MB 40.0GB <sup>2</sup> EIDE 7.2 n 3.2 533 512MB 40.0GB EIDE 7.2 n 3.2 533 512MB 36.4GB U320 10 n 3.2 533 1GB 36.4GB U320 10 n 3.2 533 1GB 40.0GB EIDE 7.2	K Ultra320,EIDE CD Quadro4 28 K Ultra320,EIDE CD-RW Quadro4 98 K Ultra320,EIDE CD-RW Quadro4 98 K Ultra320,EIDE Combo Quadro FX	0NVS 64MB       6x6       1394       XP Pro       Oct 2003         0XGL 128MB       6x6       1394       XP Pro       Oct 2003         0XGL 128MB       6x6       1394       XP Pro       Oct 2003         1000 128MB       6x6       1394       XP Pro       Oct 2003         1000 128MB       6x6       1394       XP Pro       Oct 2003         1000 128MB       6x6       1394       XP Pro       Oct 2003
Implementation	(one PCI 2.2, four PCI-X, one Mini P	processor speed cessor speed ssors (same speed/cache size) pin micro-PGA2 ZIF sockets, four DIM CI, one 8X AGP), and integrated SCSI	and ethernet
Memory - std / max Memory - features	SDRAM DIMMs / four DIMM gold-cor 2-way memory interleave / dual channel	slots used / two slots available / PC210 nector slots on systemboard / DIMMs n el / Error Checking and Correcting (ECC e chip and detects 2- through 8-bit errors of	
	(see IntelliStation Graphics sheet for • NVIDIA™ Quadro4 280NVS • NVIDIA Quadro4 980XGL • NVIDIA Quadro FX 1000 • NVIDIA Quadro FX 3000	full graphics specifications)	
		/ integrated in I/O Controller Hub 4 / tv	vo connectors on planar B/sec) / on planar / 64-bit 100MHz PCI-X /
SCSI channels and cables Cables Disk - features	supports RAID-1 mirroring (Embed Two 16-bit channels (one internal an systemboard to internal disks bays; systemboard to rear external 68-pin co EIDE models: Two EIDE cables (one SCSI models: One or two SCSI cables)	ded Mirroring) d one external) / Internal channel: one external channel: Models 29U/37U have to nnector (cable available as option part n 2-drop cable to CD-ROM, one 2-drop cs s (listed above), one 2-drop EIDE cable	3-drop 16-bit 68-pin LVD SCSI cable from one 1-drop 16-bit 68-pin LVD SCSI cable from umber 24P7929) able to EIDE disk)
Rack support Chipset	A for slots 2 and 3 and ethernet controlle	nory Controller Hub) for AGP 8X slot, P64H	2, ICH4 / P64H2 for two 64-bit PCI-X buses (Bus er) / I/O Controller Hub (ICH4) for PCI 2.2 bus PC87366 Super I/O off LPC interface
Gigabit ethernet  Diskette / Optical drives IEEE 1394(FireWire) Audio Rear ports Front ports Systems mgmt	chip on planar / PCI-X 64-bit 100MHz / 3.5" 1.44MB diskette drive and one of Combo or 48X/24X/48X Max® CD-RW FireWire controller in Mini PCI slot / Soft audio AC '97 v2.2 interface via IC Two USB (Ver 2.0), two 9-pin serial, par Two USB (Ver 2.0), audio line out (si	/ 1394A, 400Mbps, 6-pin port on rear, 4-p :H4 (AD1885) / internal speaker (use of a arallel, keyboard, mouse, ethernet, audio	rd Format 1.0 / one rear ÅJ-45 port X/24X/48X/16X Max <sup>6,19</sup> CD-RW/DVD-ROM oin port on front audio line out requires powered speakers)
Keyboard / mouse Cooling fans Power supply		MM three button mouse (6-pin PS/2 conn) bly, two in rear) / not redundant or hot-swap illt-in overload and surge protection	SECURITY     U-bolt anchoring feature (U-bolt is optional; supports optional padlock)     Security slot (for attachment of optional cable lock such as Kensington cable lock)     Cover key lock
Optical Bay	① 5.25", HH 1.6", access, optical ② 5.25", HH 1.6", access, open ③ 3.5", SL 1", access, diskette ④ 3.5", SL 1", no access, disk ⑤ 3.5", SL 1", no access, open ⑥ 3.5", SL 1", no access, open ⑥ 3.5", SL 1", no access, open 1: fullsize, 32-bit 33MHz, PCI 2.2 (5v) 2: fullsize, 64-bit 100MHz, PCI-X 1.0 3: fullsize, 64-bit 100MHz, PCI-X 1.0 4: fullsize, 64-bit 100MHz, PCI-X 1.0* 5: fullsize, 64-bit 100MHz, PCI-X 1.0 6: Mini PCI type III - FireWire : fullsize, AGP 8X (1.5v) used by std AGP graphics adapter	<ul> <li>→ Metal cage for disk bays 4,5,6 rotates out of chassis</li> <li>→ Two front stabilizing feet</li> <li>→ Handle grip on top</li> <li>→ H 17.375" x W 6.5" x D 19.375"</li> <li>→ H 441mm x W 165mm x D 492mm</li> <li>→ 36 lb to 45.8 lb (16.3kg to 20.8kg)</li> <li>• Maximum internal disk capacity<sup>13</sup>: SCSI: 438GB (3 disks x 146GB)</li> <li>• EIDE: 240GB (2 disks x 120GB)</li> <li>• Removable left side panel</li> <li>• BIOS Setup Utility via F1 at startup</li> <li>• LSI Configuration Utility near startup to pressing CTRL+C</li> <li>• Product Recovery Program via F11 at startup</li> </ul>	Cover tamper detect switch     Secure fixed DASD     Power-on password     Administrator password     Keyboard/mouse password     Boot sequence control     Boot without keyboard or mouse     Diskette boot inhibit and write-protect     Disable mouse     Diskette, disk, serial port, parallel port I/O control     Secure access openings     VPD stored in EEPROM     Write protection control for EEPROM
512MB PC2100 C 1GB PC2100 CL2. 2GB PC2100 CL2. IBM 36.4GB 10K IBM 73.4GB 10K IBM 146GB 10K IBM 12GB 7.2K IBM ThinkVision L IBM T221 22.2inL IBM 4Ux20D Tow Other options at	L3 Cache Proc Upgrade 13N0691 5L2.5 ECC DDR-SDRAM x4 33L5038 5 ECC DDR-SDRAM DIMM 33L5039 .5 ECC DDR-SDRAM DIMM 33L5040 rpm Ultra320 SCSI HDD 32P0723 rpm Ultra320 SCSI HDD 32P0725 rpm ATA-100 EIDE HDD 09N4231 .200P 20.1inLCD Black A/D 6736-HB0 CD Black Digital 9503-DG3 //er-to-Rack Conversion Kit 09N4300 ibm.com/pc/us/accessories	Adv Config Power Interface (ACPI) 1.     DMI 2.2-compliant      Preload with Windows XP Professional     Free license for Lotus® SmartSuite®     Free license for Lotus Notes® Client     Device Drivers and IBM Enhanced Diagnostics CD     IBM IntelliStation Documentation CD	⇒ 3 year parts and labor  ⇒ International Warranty Service <sup>3</sup>

See footnotes for important warranty information US models announced October 7, 2003

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		by eserver ricid skins Enablement ream										
IBM®         FSB MHz         Memory         Disk and colspan="3">Disk and cols	320 10K Ultra320,EIDE CD-RW Quadro4 980	ory         bays         FireWire         Preload¹¹         date           KGL 128MB         6x6         1394         DOS2K         Mar 2004           00 128MB         6x6         1394         XP Pro         Mar 2004										
L2 cache L3 cache Processor upgrade Implementation  Memory - std / max Memory - features  T1MB standard and maximum in the standard and and maximum in the standard and maximum in the standard and ma	at processor speed / 2MB L3 cache available vi Processors (same speed/cache size) el 604-pin micro-PGA2 ZIF sockets, four DIMM Mini PCI, one 8X AGP), and integrated SCSI ar two slots used / two slots available / PC2100 26 old-connector slots on systemboard / DIMMs mu channel / Error Checking and Correcting (ECC) on same chip and detects 2- through 8-bit errors co	I slots, seven slots and ethernet  66MHz registered 184-pin ECC DDR- lest be installed in matched pairs [a bank] / via 16-bit Checksum Chipkill™										
and cables systemboard to internal disks systemboard to rear external EIDE models: Two EIDE cable SCSI models: One or two SCS	hannel Ultra320 SCSI controller (LVD 320MB)	/sec) / on planar / 64-bit 100MHz PCI-X / -drop 16-bit 68-pin LVD SCSI cable from drop 16-bit 68-pin LVD SCSI cable from ) le to EIDE disk) o optical)										
Chipset Intel E7505 chipset / E7505 MC A for slots 2 and 3 and ethernet (one slot and one Mini PCI slot),	4U <sup>4</sup> rack mount support via tower-to-rack kit option  Intel E7505 chipset / E7505 MCH (Memory Controller Hub) for AGP 8X slot, P64H2, ICH4 / P64H2 for two 64-bit PCI-X buses (Bus A for slots 2 and 3 and ethernet controller; Bus B for slots 4 and 5 and SCSI controller) / I/O Controller Hub (ICH4) for PCI 2.2 bus (one slot and one Mini PCI slot), ATA-100 EIDE, USB, Low Pin Count Interface / NS PC87366 Super I/O off LPC interface											
chip on planar / PCI-X 64-bit 10 3.5" 1.44MB diskette drive an Combo or 48X/24X/48X Max <sup>6</sup> IEEE 1394(FireWire) Audio Soft audio AC '97 v2.2 interface Rear ports Two USB (Ver 2.0), two 9-pin s Front ports Two USB (Ver 2.0), audio line		I Format 1.0 / one rear ÅJ-45 port 24X/48X/16X Max <sup>6,19</sup> CD-RW/DVD-ROM n port on front dio line out requires powered speakers)										
Cooling fans Three variable speed fans (pow	S/2) / IBM three button mouse (6-pin PS/2 conn) er supply, two in rear) / not redundant or hot-swap sing / built-in overload and surge protection	SECURITY     U-bolt anchoring feature (U-bolt is optional; supports optional padlock)     Security slot (for attachment of optional cable lock such as Kensington cable lock)     Over key lock										
Optical Bay 2 5.25", HH 1.6", access, ope	x tette x x x x x x x x x x x x x x x x	IBM Security Solutions										
512MB PC2100 CL2.5 ECC DDR-SDRAM x4 33 1GB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33 2GB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33 IBM 36.4GB 10K rpm Ultra320 SCSI HDD 32 IBM 73.4GB 10K rpm Ultra320 SCSI HDD 32 IBM 146GB 10K rpm Ultra320 SCSI HDD 32 IBM 120GB 7.2K rpm ATA-100 EIDE HDD 09 IBM ThinkVision L200P 20.1inLCD Black A/D 67	Adv Config Power Interface (ACPI) 1.0a     DMI 2.2-compliant     DMI 2.2-compliant     Preload with Windows XP Professional     Microsoft® Windows® XP Professional     Free license for Lotus® SmartSuite®     Free license for Lotus Notes® Client     Device Drivers and IBM Enhanced     Diagnostics CD     BM IntelliStation Documentation CD	⇒ 3 year parts and labor  ⇒ International Warranty Service <sup>3</sup>										

Other options at ibm.com/pc/us/accessories See footnotes for important warranty information US models announced March 16, 2004

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	·						and the same of the
IBM® Type-GAV-model Proces	ssor & GHz <sup>1</sup> L2	Memory Disk & rp	Disk n controllers	Optical	Graphics adap and memory		Availa Preload <sup>17</sup> d
6223-10y-10U 1 x Xec 6223-11y-11U 1 x Xec 6223-14y-14U 1 x Xec 6223-21y-21U 1 x Xec	on 3.4GHz 1MB on 3.4GHz 1MB	512MB 80GB 7 1GB 80GB 7 1GB 73GB 1		CD-ROM CD-RW COMBO CD-RW	Quadro NVS 280 6 Quadro NVS 280 6 Quadro FX 3400 2 Quadro FX 1300	64MB 1394 6x6 64MB 1394 6x6 256MB 1394 6x6	XP Pro Spet 20 XP Pro Sept 20 XP Pro Sept 20 XP Pro Sept 20
6223-22y-22U 1 x Xec 6223-23y-23U 1 x Xec 6223-24y-24U 1 x Xec 6223-28y-28U 1 x Xec 6223-29y-29U 2 x Xec	on 3.6GHz 1MB on 3.6GHz 1MB on 3.6GHz 1MB on 3.6GHz 1MB	1GB 73GB 1 1GB 80GB 7 1GB 73GB 1 1GB 73GB 1	0K Ultra320 .2K SATA 0K Ultra320 0K Ultra320	CD-RW COMBO COMBO CD-RW CD-RW	Quadro FX 1300 Quadro FX 3400 Quadro FX 3400 Quadro FX 1300 Quadro FX 3400 Quadro	128MB 1394 6x6 256MB 1394 6x6 256MB 1394 6x6 256MB 1394 6x6	XP Pro Sept 20 XP Pro Sept 20 XP Pro Sept 20 XP Pro Sept 20 RH 3 Sept 20 RH 3 Sept 20
Processor 1 L2 cache 1 Processor upgrade 2 Implementation S	MB standard and -way SMP / up to systemboard contains	on at 3.4, 3.6GHz I maximum / at protection two Xeon Procections two Intel 604	with 800MHz rocessor speed essors (same s I-pin micro-PG	frontside bu d speed/cache dA2 ZIF socke	size) ets, six DIMM slot	ded Memory 64 Teo s, six slots 'A and gigabit ethern	<b>.</b>
	DIMMs / six DIMM -way memory inte	gold-connector sl rleave / dual cha	ots on systemb nnel / <b>Error C</b> h	ooard / DIMM hecking and	s must be installed	d in matched pairs [a / optional <b>16-bit Ch</b>	bank] /
		I NVS280 2D 641 FX 1300 3D 1281	/IB PCI-Expres /IB PCI-Expres	ss ss			
SCSI controller SCSI channels and cables SCADIES SCADIES SCADIES SCADIES SCADIES SCADIES SCADIES	Adaptec® 7902 / dostRAID supports wo 16-bit channe ystemboard to int ystemboard to reaseATA models: Two SCSI models: One	lual channel Ulti s RAID-0 & 1 mi ls (one internal a ernal disks bays; ar external 68-pir s SATA cables (1 or two SCSI cab	ra320 SCSI co rroring nd one externa External char connector (op drop) les (listed abo	al) / Internal connel: Optiona part nur	0 320MB/sec) / on channel: one 3-dro lly available 1-dro nber 24P7929) e 2-drop EIDE cab	ar /supports SATA F planar / 64-bit 100M p 16-bit 68-pin LVD p 16-bit 68-pin LVD le (to optical) 10K rpm / 4.7 ms; A/	MHz PCI-X / SCSI cable from SCSI cable fron
Chipset Ir	upports Adaptec 79	/ E7525 MCH (Me 102, 2 64bit/100MH:	mory Controller z PCI-X slots (5	Hub) for PCI- & 6), BUS B s	supports one 64bit/1	oadcom, PXH, ICH5R 33MHz PCI-X slot (4) IS PC87366 Super I/C	ICH5R for two 3
Diskette / Optical E drives 4 IEEE 1394(FireWire) F Audio A Rear ports Front ports	hip on planar / PC Diskette: none Opt 8X/32X/48X Max <sup>6</sup> FireWire on planar AC - 97 Audio, ADI	EI-X 64-bit 100MH tical: One of the f CD-RW / 1394A, 400Mbp 1981B via ICH5r / , two 9-pin serial, , audio line out (s	z / full duplex / ollowing: 48X-2 os, 6-pin port o internal speako parallel, keyboa stereo), mic in a	Wake on LAI 20X <sup>6</sup> CD-ROM on rear, 4-pin er (use of aud trd, mouse, et / 4-pin 1394	N® / Alert Standard 1, 48X/24X/48X/16 port on front lio line out requires hernet, audio line ir	ernet MAC and PHY Format 2.0 / one rea X Max <sup>6,19</sup> CD-RW/DV powered speakers) h, audio line out, mic i	ar <sup>°</sup> RJ-45 port /D-ROM Combo
	BM 104-key keybo Four variable speed 30 watts / univers	d fans (1 PCI, 1 F	IDD, 2 Fr) / no / built-in overlo	t redundant o ad and surge	r hot-swap protection	U-bolt anchoring feat optional; supports optional; supports optional; supports options are supports options.	ure (U-bolt is ional padlock)
© Bay ® Bay ® Bay ® Bay ® Bay ®	3.5", SL 1", no 3.5", SL 1", no 3.5", SL 1", no	ess, open ess, open access, disk access, open access, open	rotates out  Two front s  Handle grip  H 18.5" x \  H 450mm	stabilizing feet	4,5,6 0.5" x D 496mm	cable lock such as Ke Cover key lock Cover tamper detect Secure fixed DASD Power-on password Administrator passw Boot sequence cont	ensington cable lo switch rord
Mini-tower Raven black (Fan )  Slot 2: Slot 3: Slot 4: Slot 5: Slot 5: * - Mus	fullsize, PCI-Expres fullsize, 32-bit 33MI fullsize, 32-bit 33MI fullsize, 64-bit 133M fullsize, 64-bit 100M fullsize, 64-bit 100M tullsize, 64-bit 100M to be used if installing	Hz, PCÌ (5v) Hz, PCI (5v) Hz, PCI-X 1.0 (3.3v HHz, PCI-X 1.0*(3.3v HHz, PCI-X 1.0 (3.3v g ServeRAID 6i+	SCSI: 5840 SATA: 5000 with optional Signature of the second of the secon		146GB) 250GB), 1TB 4 disks x 1TB) at startup ity near startup	Boot without keyboar Diskette boot inhibit at Disable mouse Diskette, disk, serial pl/O control Secure access openi VPD stored in EEPRO Write protection control IBM Security Solution	nd write-protect port, parallel port ngs OM rol for EEPROM
Xeon 3.4GHz/1MB L2 Xeon 3.6GHz/1MB L2 512MB PC3200 CL3 EC 1GB PC3200 CL3 EC 1GB PC3200 CL3 EC 2GB PC3200 CL3 EC IBM 73.4GB 10K rpm IBM 146GB 10K rpm IBM 160GB 7.2K rpm IBM ThinkVision L200I IBM T221 22.2inLCD E IBM 4Ux20D Tower-tc Other options at ibm.	Cache Proc Upgra ECC DDR2-SDRAM C DDR2-SDRAM C DDR2-SDRAM C C DDR2-SDRAM C Ultra320 SCSI HDD Ultra320 SCSI HDD SATA-150 HDD P 20.1inLCD Black Black Digital D-Rack Conversion	dde 13N0675 // 73P3523 73P3522 ChipK 73P2866 ChipK 73P2866 // 32P0724 32P0725 09N4254 A/D 6736-HBC 9503-DG8 Kit 13N2455	Adv Config     DMI 2.2-cor      Preload with     Microsoft® W     Free licens     Pevice Driv     Diagnostic     IBM IntelliS	n Windows XI indows® XP P se for Lotus® S se for Lotus No vers and IBM	P Professional <sup>17</sup> rofessional martSuite® cites® Client Enhanced entation CD	LIMITED WA  3 year parts and late International Warra On site, 8 am through Mon through Fri ex next business day of the control of the contro	oor nty Service <sup>3</sup> gh 5 pm, cluding holidays esponse time ervice upgrade as ServicePac vw.ibm.com/ /wamomxeu.pdf port for warrant

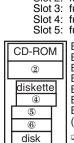
Cranbias	NIVIDIA	NVIDIA	NVIDIA	NVIDIA	NVIDIA	NVIDIA	NVIDIA
Graphics Adapter	NVIDIA Quadro™ NVS 280	Quadro4™ 580 XGL	Quadro FX 500	Quadro 4 980 XGL	Quadro FX 1100	Quadro FX 3000	Quadro FX 4000
Category	Perf 2D	Entry 3D	Advanced 3D	Advanced 3D	Advanced 3D	High-Adv 3D	Extreme 3D
Total Memory	64MB	64MB	128MB	128MB	128MB	256MB	256MB
Memory Type	200MHz DDR-SDRAM	275MHz DDR-SDRAM	243MHz DDRSDRAM	325MHz DDR-SDRAM	325MHz DDRSDRAM	425MHz DDR SDRAM	500MHz GDDR3 SDRAM
RAMDAC Detail	Dual 350Mhz	Dual 350Mhz	Dual 350MHz	Dual 350Mhz	Dual 400MHz	Dual 400MHz	Dual 400MHz
Graphics Pipeline	64-bit	128-bit	128-bit	128-bit	128-bit	256-bit	256-bit
Supported Bus	AGP 8X	AGP 8X	AGP 8X	AGP 8X	AGP 8X	AGP 8X	AGP 8X
Maximum Displays	Two	Two	2 Analog 1 Digital	Two	Two	Two	Two
Supported Displays Analog - Digital CRT - Flat Panel -	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Max Analog Resolution	2048x1536x32 @ 60Hz	2048x1536x32 @ 60Hz	2048x1536x32 @ 75 Hz	2048x1536x32 @ 60Hz	2048x1536x32 @ 85 Hz	2048x1536x32 @ 85Hz	2048x1536x32 @ 85Hz
Max Digital Resolution	1280x1024x32 @ 60Hz	1280x1024x32 @ 60Hz	1600x1200x32 @ 60Hz	@ 60Hz	1600x1200x32 @ 60Hz 2048x1536x32 @ 41Hz 3840x2400x32 @ 13Hz	1600x1200x32 @ 60Hz 3840x2400x32 @ 48Hz	2048x1536x32 @ 60Hz 3840x2400x32 @ 48Hz
Connectors	One LFH60	One LFH60	One DVI-I to 3- pin stereo, One VGA	Two DVI-I, One 3-pin stereo	Two DVI-I, One 3-pin stereo	*Two DVI-I, One 3-pin stereo	*Two DVI-I, One 3-pin stereo
Cables Included	One LFH-to-Dual DB-15 cable included, LFH-to-Dual DVI-I optional	One LFH-to-Dual DB-15 cable included, LFH-to-Dual DVI-I optional	One DVI-I -to- DB-15 cable included	Two DVI-I -to- DB-15 cables included	Two DVI-I -to- DB-15 cables included	Two DVI-I -to- DB-15 cables included	Two DVI-I -to- DB-15 cables included
Other						*One single- link DVI-I and One dual-link DVI-I	*Two dual-link DVI-I and One dual-link DVI-I

NOTE: Four-head and/or TV-in graphics adapters available by special bid

Graphics Adapter	NVIDIA Quadro™ NVS 280	ATI FireGL™ V3100	NVIDIA Quadro FX 1300	NVIDIA Quadro FX 3400		
Category	Perf 2D	Value 3D	Advanced 3D	High-Adv 3D		
Total Memory	64MB	128MB	128MB	256MB		
Memory Type	200MHz DDR SDRAM	400MHz DDR SDRAM	275MHz DDR SDRAM	450MHz DDR3 SDRAM		
RAMDAC Detail	Dual 350Mhz	Dual 400MHz	Dual 400MHz	Dual 400MHz		
Graphics Pipeline	64-bit	256-bit	256-bit	256-bit		
Supported Bus	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16		
Maximum Displays	Two	Two	Two	Two		
Supported Displays Analog - Digital CRT - Flat Panel -	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes		
Max Analog Resolution	2048x1536x32 @ 60Hz	2048x1536x32 @ 85 Hz	2048x1536x32 @ 60 Hz	2048x1536x32 @ 85 Hz		
Max Digital Resolution	1280x1024x32 @ 60Hz	1600x1200x32 @ 60 Hz	@ 60 Hz	1600x1200x32 @ 60 Hz 3840x2400x32 @ 48 Hz		
Connectors	One DM5-59	One DVI-I, One VGA, One 3-pin stereo	*Two DVI-I, One 3-pin stereo	*Two DVI-I, One 3-pin stereo		
Cables Included	One DM5-59-to- Dual DB-15 cable included	Two DVI-I -to- DB-15 cables included	Two DVI-I -to- DB-15 cables included	Two DVI-I -to- DB-15 cables included		
Other	DM5-59-to- dual VGA option			*One single-link DVI-I and One dual-link DVI-I		

NOTE: Four-head and/or TV-in graphics adapters available by special bid

	For GAV systems, lowercase "x" should be replaced with a country-specific code.														
				se "x" should be re	placed with			de.							
		/I® Mach GAV	nine model	Processor	GHz <sup>1</sup>	L2 cache	FSB MHz	Memory	Disk	Disk controlle	Maximum er Capacity	PCI slots x bays	Hard disk bays	Ethernet	Available date
*	8482 8482 8482 8482 8482	1Rx 1Sx 2Mx	11X 14X 15X 21X 24X	Pentium 4® Pentium 4 Pentium 4 Pentium 4 Pentium 4	2.8 2.8 2.8 3.0 3.0	1MB 1MB 1MB 1MB 1MB	800 800 800 800 800	512MB 512MB 256MB 512MB 512MB	None 36.4GB U320 None None 36.4GB U320	SCSI SATA SCSI	440.4GB 587.2GB 320GB 440.4GB 587.2GB	5 x 7 5 x 7	3 hot-swap 4 fixed 2 simple-swap 3 hot-swap 4 fixed	Gigabit Gigabit Gigabit	Apr 2004 Apr 2004 Apr 2004 Apr 2004 Apr 2004
≫	8482	2Sx 9Mx 3Mx 3Rx	25X	Pentium 4 Celeron® Pentium 4 Pentium 4 Pentium 4	3.0 2.4 3.2 3.2 3.2	1MB 128KB 1MB 1MB 1MB	800	256MB 256MB 512MB 512MB 256MB	None 80GB SATA None 36.4GB U320 None	SATA SATA SCSI	320GB 320GB 440.4GB	5 x 7 5 x 7	2 simple-swap 2 simple-swap 3 hot-swap 4 fixed 2 simple-swap	Gigabit Gigabit Gigabit Gigabit	Apr 2004 Apr 2004 Jun 2004 Jun 2004
60	Position Procedu L2 ca	oning essor(s	s)	uniproces Intel® Pe Up to 1M	ssor, en ntium 4 IB std a	try serve 2.8, 3.0 nd max /	r desig , <b>or 3.</b> ECC /	gned to m 2Ghz with full speed	eet small busir n 800MHz fron	ness need tside bus	ds and bud (FSB) or	<i>lgets</i> Celeron	at 2.4GHz		
		suppo		one AGP No SMP	slot, et	hernet co	ontrolle	r, connect	tor for extender	board (t	wo PCI slo	ts and gr	raphics controll	er)	,
	Memo	ory		PC2700 3 All Error	33MHz Checkin	ECC DDI g and Co	R-SDR/ orrectir	AM (modeling (ECC) /	gold-plated DIM ls 1xx and 2xx) DIMMs and EC DIMM configurati	PC3200 C memory	400MHz Ed controller	cc DDR-9 industry	SDRAM (model std / unbuffered	s 3xx) /	nodels /
	IDE d SATA Cable Disk	isk co disk d	ontrolle ntroller controlle	Enhance er Some: di One 2-dr Some: 36	d IDE / A ual char op EIDE 3.4GB U	ATA-100 inel SAT cables 320 SCS	/ integ A-150 (to CD I / 10,0	rated in I/0 controller 0-ROM) / 3 000 rpm / 4	ntroller (LVD 3 O Controller Hu (150MB/sec) Some: one 5-di 4.7 ms seek / anar / supports	ib / one c rop LVD \$ <i>Some:</i> 80	onnector o SCSI cable GB SATA	<i>  Some.</i>   7,200 rp	om / 9.0 ms / <i>A</i>	<i>II:</i> S.M.A.I	₹.T.
				ow) One PCI Intel E72	bus / thr <b>10 chip</b> ernet M	ee 32-bit <b>set</b> / Me AC, USE	: 33MH mory 0 3, Low	Controller I Pin Count	kit option 2.2 slots / two 6 Hub (MCH) / I/0 t Interface / Firr	O Control	ler Hub (IC	H-S) for	PCI 2.2 and P	CI-X bus,	ATA-100
	Etherr CD-Re Ports	OM /	diskette	Preboot e CD-ROM	Xecutio 2: 48X-20 5 USB (	n Enviro 0X <sup>6</sup> CD-F Ver 2.0);	nment ROM,	(PXE) / W IDE / <i>Disl</i>	nar / full duplex /ake on LAN® / kette: 3.5" 1.44 al (9-pin), parall	Alert Star MB diske	ndard Forn ette drive	nat 2.0	pard, mouse, et	thernet (F	J-45),
		iostics ms mo	gmt cnt	Diagnostion Diagnostion	LEDS / system	error LEI	cessor	temperat	emory / server oure, fan speed or Adapter II (	and failu	ire, and vo	Itages /			
	Graph	nics co	ontrolle					AM std/max analog 15-	c / pin D-Sub conn	512MB	PC2700 C	L2.5 ECC	DDR UDIMM DDR UDIMM DDR UDIMM		06P4053 06P4054
	Secur	rity		via knocl	out / po	ower-on on withou	passw It keyb		J-Bolt support sequence se /	256MB 512MB 1GB PC IBM 800	PC3200 C PC3200 C 3200 CL2 GB 7200 rp	L2.5 ECC L2.5 ECC 5 ECC E om simple	C DDR UDIMM C DDR UDIMM DDR UDIMM e-swap SATA-	150 HDD	
	Softw	are		installatio	n and c	onfigurat	ion to	ol), IBM D	etwork OS irector any utilities	32X/10X IBM Rer	(/40X/16X mote Supe	Max <sup>6</sup> CE rvisor Ac	t-swap U320 H D-RW/DVD (bla dapter II (PCI a	ack)	32P0726 22P6973 59P2984 09N4300
	Coolir	Keyboard / mouse Cooling fans  New supply  Power supply  Restart (ASR) / not hot-swap / no redundancy / cooling fan in power supply (variable speed)    Mathematical Controller (13N2196)   18M ServeRAID-6i+ Controller (13N2196)   18M ServeRAID-7T													
		Slot Slot Slot	2: fulls 3: fulls 4: fulls	size, 64-bit 66 size, 64-bit 66 size, 32-bit 33 size, 32-bit 33 size, 32-bit 33	SMHz, P SMHz, P SMHz, P	CI-X (3.3 CI 2.2 (5 CI 2.2 (5	3v) v) v)	♦ (	Removable left Configuration/S memory) invoke startup Advanced Confi	etup Utilited by pres	ty (in flash ssing F1 at	✓ Interest On single Mon-	LIMITED WA ar parts and lab national Warrar ite, 8 am-5 pm, Fri excluding h business day r	or nty Servic iolidays,	<b>e</b> <sup>3</sup>



Mini-tower

Stealth

black

Bay ① 5.25", HH1.6", access, CD-ROM Bay ② 5.25", HH1.6", access, open (no disk) Bay © 3.25", SL 1", Bay © 3.5", SL 1", access, diskette access, open access (some), open access (some), open access (some), std disk + H 448mm x W 165mm x D 483mm (some)

Metal cage for disk bays 5,6,7 rotate out of chassis for easy access for cabling backplane or working with disks

Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent componet failure

Advanced Configuration Power

Interface (ACPI) 1.0 Device Drivers and Diagnostics

CD-ROM included Four stabilizing feet

→ Handle grip on top
 → H 17.25" x W 6.5" x D 19.0"

♦ 35 to 42 pounds (15.9 to 19.1kg)

Maximum SATA capacity: 320GB<sup>13</sup> (2 disks x 160GB) Maximum hot-swap SCSI capacity:

Mon-Fri excluding holidays next business day response time On site service upgrade

options (in eligible locations):7 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9512)

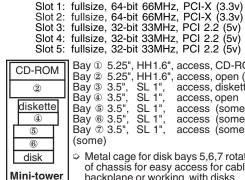
3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9511) 3 year IOR 9x5, 4 hr avg response

(ServicePac part num 69P9510) 3 year IOR 9x5, NBD response (ServicePac part num 69P9509)

Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

439.2GB13 (3 disks x 146.4GB) Maximum fixed SCSI capacity: 585.6GB<sup>13</sup> (4 disks x 146.4GB)

	For GAV systems, lower	case "v" should be replace	•	_	de.			•		-	-	-
	IBM® Machine Type GAV mode			2 FSB	Memory	Disk	Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Ethernet	Available date
F	8482 - 4My -41x 8482 - 4Ry -44x 8482 - 4Sy -45x 8482 - 5My -51x 8842 - 5Ry -54x 8842 - 5Sy -55x	Pentium 4® EM64 Pentium 4 EM64 Pentium 4 EM64 Pentium 4 EM64 Pentium 4 EM64 Pentium 4 EM64	7 3.2 1M 7 3.2 1M 7 3.4 1M 7 3.4 1M	ИВ 800 ИВ 800 ИВ 800	512MB 512MB 256MB 512MB 512MB 256MB	None 36.4GB U320 None None 36.4GB U320 None	SATA	440.4GB 587.2GB 500GB 440.4GB 587.2GB 500GB	5 x 7	3 hot-swap 4 fixed 2 simple-swap 3 hot-swap 4 fixed 2 simple-swap	Giğabit Gigabit Gigabit Gigabit	Jan 2005 Jan 2005
	Positioning Processor(s) L2 cache Implementation	Intel® Penti Up to 1MB	um 4 3.2 std and mad d contains	<b>&amp; 3.4 Gh</b> ax / ECC / one m478	<b>z with 800</b> full speed BPGA soc	ket (processor	imized fo	or Extend	ed Memo	ory 64 Techno	• •	,
	SMP support	No SMP su	oport / no	processor	upgrade							
	Memory	SDRAM / A	II Error Ch	ecking an	d Correctir		VIs and EC	C memory	controlle	PC3200 400MH r / industry std / i d pairs [a bank]		
	SCSI disk control IDE disk controlle SATA disk contro Cables Disk RAID Controller	er Enhanced II oller 4Sy: single One 2-drop 4Ry: 36.4GI	DE / ÅTA-1 channel S EIDE cab 3 U320 SC	100 / integ SATA-150 les (to CD CSI / 10,00	rated in I/C controller I-ROM) / 4 IO rpm / 4.7	<i>My &amp; 4Ry:</i> one 7 ms seek / S	b / one co supports e 5-drop l .M.A.R.T.	onnector of 2 drives of VD SCSI	n planar standard cable / 4	/sec) / supports 4 dr # <i>Sy:</i> one 2-drop upports ServeR	SATA c	able
	Rack support Bus slots (see be Chipset	4U <sup>4</sup> rack mo elow) One PCI but Intel E7210 EIDE, ether parallel, ser	s / three 32 <b>chipset</b> / net MAC, l	2-bit 33MH Memory 0 USB, Low	lz 5v PCI 2 Controller H Pin Count	2.2 slots / two 6 Hub (MCH) / I/(	O Controll	er Hub (IC	CH-S) for	/ no hot-swap / PCI 2.2 and P0 M192 Super I/O	CI-X bus,	ATA-100
	Ethernet CD-ROM / disket Ports Diagnostics Systems mgmt	te CD-ROM: 4 Front: two U monitor (and Diagnostic LI Monitors sy	ecution Env 8X-20X <sup>6</sup> C JSB (Ver 2 alog DB-15 EDs / error stem and	vironment D-ROM, 1 2.0); Back 5) LEDs for fa processor	(PXE) / W IDE / Disk :: two seria ans and me temperate	emory / server oure, fan speed	Alert Star MB diske el, two Us liagnostic p and failu	ndard Forn tte drive SB (Ver 2. programs s re, and vo	nat 2.0 0), keybootored on lotages /	pard, mouse, et IBM Enhanced D monitoring and	Diagnostic	s CD
	Graphics controll	er SVGA / ATI®	Radeon™	7000M / 16	MB SDRA	M std/max / on p	olanar / ana	alog 15-pin				
	Security	Mechanical : via knockou control / op cover tampe	t / power- eration wit	on passw hout keyb	ord / boot oard/mous		512MB F 1GB PC IBM 800	PC3200 C 3200 CL3 3B SATA-	L3 ECC ECC DE 150 (7.2k	DDR UDIMM DDR UDIMM DR UDIMM () simple-swap		06P4049 06P4050 06P4051 73P8002
	Software	ServerGuid installation a (system har	and config	uration to	ol), IBM Di	rector	IBM 250 IBM 36.4	GB SATA 1GB 10K I	150 (7.2 hot-swap	2K) simple-swa <sub>l</sub> 2K) simple-swa <sub>l</sub> U320 HDD U320 HDD		73P8003 73P8006 32P0726 32P0724
	Keyboard / mous Cooling fans Power supply		(fansink, re dels / not universal / R) / not ho	ear, pwr su redundant auto swite ot-swap /ne	upply) plus / not hot-s ch / Autom o redundar iable spee	additional fan swap atic Server ncy / d)	IBM 146 IBM 36.4 IBM 73.4 32X/10X IBM Rer IBM Ser IBM Ser IBM 20/4 IBM 40/8 Other op	.8GB 10K 4GB 15K I 4GB 15K I /40X/16X note Supe (20D Tow veRAID-6 veRAID-7 40GB TR7 30GB DLT ptions at	hot-swap hot-swap hot-swap Max <sup>6</sup> CE ervisor Ac er-to-Rac i+ Contro t SATA C Internal	o U320 HDD U320 HDD U320 HDD O-RW/DVD (bla dapter II (PCI a ok Kit	dapter)  De Drive	32P0725 90P1318 90P1319 22P6973 59P2984 09N4300 13N2190 71P8648 48P7042
					A F	Pamayahla laft	Other of	otions at				24P2



Stealth

black

Bay ① 5.25", HH1.6", access, CD-ROM
Bay ② 5.25", HH1.6", access, open (no disk)
Bay ③ 3.5", SL 1", access, diskette
Bay ④ 3.5", SL 1", access, open
Bay ⑤ 3.5", SL 1", access (some), open
Bay ⑥ 3.5", SL 1", access (some), open
Bay ⑦ 3.5", SL 1", access (some), std di (some)

Metal cage for disk bays 5,6,7 rotate out of chassis for easy access for cabling backplane or working with disks

Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Removable left side panel

Configuration/Setup Utility (in flash) memory) invoked by pressing F1 at startup

 Advanced Configuration Power Interface (ACPI) 1.0

Device Drivers and Diagnostics

CD-ROM included

♦ Four stabilizing feet

♦ Four stabilizing 1.55.
♦ Handle grip on top
♦ H 17.25" x W 6.5" x D 19.0"
♦ H 448mm x W 165mm x D 483mm

access (some), std disk \$ 35 to 42 pounds (15.9 to 19.1kg)

Maximum SATA capacity 500GB13 (2 disks x 250GB) w/ optional ServeRAID 7t (4 disks x 1TB)

Maximum hot-swap SCSI capacity: 439.2GB<sup>13</sup> (3 disks x 146.4GB) Maximum fixed SCSI capacity: 585.6GB¹³ (4 disks x 146.4GÉ)

LIMITED WARRANTY<sup>3</sup>

→ 1 year parts and labor

→ International Warranty Service<sup>3</sup>

On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time

On site service upgrade options (in eligible locations):<sup>7</sup>
• 3 year IOR 24x7, 2 hr avg response

(ServicePac part num 69P9512) 3 year IOR 24x7, 4 hr avg response

(ServicePac part num 69P9511) 3 year IOR 9x5, 4 hr avg response

(ServicePac part num 69P9510) 3 year IOR 9x5, NBD response

(ServicePac part num 69P9509) Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty

issues during the warranty period

IBM® Type-model Processor		L2 cache	FSB MHz	Memory	Di	isk	С	Disk controller		Hot-sw disk ba		PCI slots x bays		er supply er and typ	e Etherne	Available date
8649-42X 1 x Xeon <sup>T</sup> 8649-4AX 1 x Xeon 8649-4BX 1 x Xeon 8649-52X 1 x Xeon 8649-5AX 1 x Xeon 8649-5BX 1 x Xeon 8649-6AX 1 x Xeon 8649-6BX 1 x Xeon 8649-6BX 1 x Xeon	2.8B 2.8B 2.8B	512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB	533 533 533 533 533 533 533 533	512MB 512MB 512MB 512MB	36.4GB <sup>2</sup> None (or None (or 36.4GB ( None (or 36.4GB ( None (or None (or	pen-bay) Jitra320 pen-bay) pen-bay) Jitra320 pen-bay)	10K (	Ultra320 Ultra320 Ultra320 Ultra320	6 No 6 No 6	one (4 hot-sw hot-sw one (4 hot-sw one (4 hot-sw hot-sw	rap fixed) rap rap fixed) rap	6 x 9 6 x 9 6 x 7 6 x 9 6 x 9	One Two One One Two One One	fixed fixed redunda fixed fixed	Giğabii nt Gigabit Gigabit Gigabit nt Gigabit Gigabit	Feb 200 Feb 200 Feb 200 Feb 200
Processor(s) SMP - L2 Cache Implementation	Syster	nboard c	ontains	s two Intel	<b>Iz with 53</b> Processors 604-pin n available <i>A</i>	nicro-PG <i>P</i>	\ ZIF s	sockets.	four [	DIMM s	slots, s	eading teon and max / seven slot	chnolog at pro ts (one	gy icessor sp i PCI 2.2,	eed four PCI-X	one Mini
Memory	DDR-9 2-way	SDRAM I memory	DIMMs interle	s / four DII ave / dua	l channel /	connector / <b>Error C</b> l	slots ( <b>hecki</b> )	on syster <b>ng and (</b>	nboa C <b>orre</b>	rd / DIN e <b>cting (</b>	MMs n <b>(ECC)</b>	nust be ir via <b>16-b</b>	istalled it <b>Che</b>	l in match <b>cksum C</b>	CC ed pairs [a hipkill™ (co 3 and grea	orrects 1, 2
IDE disk controller SCSI disk controller SCSI channels and cables	support 5, 00, one 4-	<b>ogic® 530</b> rts <b>RAID</b> 10, 1E0, drop 16-	<b>C1030</b> - <b>1 mir</b> -50 (insbit 68-	/ dual ch roring (Er stalled only oin LVD S	nbedded N y in Slot 4) SCSI cable	ra320 SC Mirroring) Two 16-l from svs	SI cou / shar bit cha tembo	ntroller ( red with o annels (or oard to in	LVD option ne int terna	320ME al IBM ernal a I disks	3/sec) / Serve ind one bavs:	/ on plana RAID™-t e externa Hot-swar	air / 64 5i Cont I) / <i>Inte</i> 5 mode	-bit 100Ml croller for I ernal chan els: one 1	Hz PCI-X / ow-cost RA nel: Fixed o drop 16-bit to rear exte	ilsk models 68-pin LV
Cables Disk - features	Conne One S Some		e (liste 3 Ultra3	d above), 320 SCSI	one 2-dro / 10K rpm	p EIDE c /4.7 ms	able ( avera	to CD-Rige read s	OM) seek	/ S.M.A	\.R.T.⁵					·
Rack support Bus slots (see below Chipset	Four 6 Intel E for slot	4-bit 100 <b>7505 ch</b> ts 2 and :	MHž F <b>ipset</b> / 3 and (	PCI-X 1.0 / E7505 M ethernet c	ICH (Memontroller; E	2.2 / öne   ory Contr Bus B for :	Mini P oller H slots 4	Hub) for <i>P</i> I and 5 a	AGP 8 and S	3X slot, CSI coi	, P64H ntroller	12, ICH4 / 1) / I/O Co	/ P64H ontrolle	l2 for two r Hub (ICI	™ PCI slots PCI-X buse H4) for PCI .PC interfac	es (Bus A 2.2 bus
Ethernet  CD-ROM / diskette Ports  Diagnostics Systems mgmt cntrl	chip on CD-Ro Front: monito Diagno Winbo	n planar / 2M: 48X: two USI or (analogostic LEC and® W79	PCI-X 20X6 ( 3 (Ver 3 DB-1 0s / err 11D / 0	( 64-bit 10 CD-ROM, 2.0); Bac 5), microp or LEDs f chip on pla	IOMHz / ful IDE / <i>Dis</i> ck: two US phone-in (r or fans an	ll duplex / kette: 3.5' iB (Ver 2.0 mono), line id memor nitors syste	Wake " 1.44l 0), two e-in (s y / sei em an	e on LAN MB diske o serial (s stereo), lii rver diag nd proces	® / Allette d 9-pin) ne-ou nostices	ert Star rive , parall tt (stere progra empera	ndard I el, key eo) ams st ature, fa	Format 1 board, mand tored on an speed	.0 / on louse, IBM E I and fa	e rear RJ- ethernet ( nhanced l ailure, and	RJ-45), Diagnostics	CD
Graphics controller					-										oin D-Sub c	onn
Security	hot-sw power	ap mode on pass	els) / op word /	otional U-l boot sequ	(locks ho Bolt suppo uence con urity slot (fo	rt via kno trol / oper	ckout ration	/ k) 2	Keon Keon 2x256	2.80 G 3.06 G MB PC	iHz/53 iHz/53 22100	3/512KB 3/512KB CL2.5 E(	L2 Ca L2 Ca CC noi	che Proc che Proc che Proc n-Chipkill -SDRAM	Upg	24P7861 24P8054 24P8122 73P2868 33L5038
Software	and co		où tool	), IBM Dir	omated ne rector (syst			Illation 1 mgmt 2	IGB F 2GB F BM 7	PC2100 PC2100 3.4GB	0 CL2. 0 CL2. 10K U	5 ECC D 5 ECC D Jltra320 S	DR-SI DR-SI SCSI 6	DRAM DI DRAM DI 8-pin (not	MM hot-swp)	33L5039 33L5040 32P0724
Keyboard / mouse Cooling fans Power supply(s)	up to s power All: n Some. xBX: All:	six / three supply o ot redund one 425 two 514 universi	e for prage fadant / ro dant / ro watt st watt st al / vol	rocessor(s ns (three not hot-swa std and m std and m tage-sens	ouse (both s), memory in dual pov ap / all var ax / not ho ax / hot-sw ing / Auto power supp	y, and dis wer suppl iable spec ot-swap vap / redu matic Ser	k bays y mod ed indant ver	S/2)	BM 3 BM 7 BM 1 IOX/1: BM F BM 4 BM S BM S	6.4GB 3GB 10 46GB 2X/40X Remote U Exte ServeR/ ServeR/	15K U 0K Ultr 10K U Max <sup>6</sup> Super ended AID-5i AID-6i	Iltra320 S ra320 SC Itra320 S CD-RW rvisor Ad Depth To Controlle Controlle	SCSI Hot CSI Hot interna apter I wer-to er (ada er (ada	3-pin (not lot-Swap SL st-Swap SL ot-Swap S al (black) I (PCI ada -Rack Kit oter for Sl accessorie	SL HDD HDD L HDD apter) ot 4) ot 4)	32P0725 06P5776 32P0727 32P0728 22P6976 59P2984 59P4817 25P3492 71P8595
Slot 1: half-length, 32 Slot 2: fullsize, 64-bi Slot 3: fullsize, 64-bi Slot 4: fullsize, 64-bi	t 100Ml t 100Ml	Hz, PCI-) Hz, PCI-)	〈 1.0 ( 〈 1.0 (	3.3v) 3.3v)	ended*	<ul><li>♦ Raver</li><li>♦ Remo</li><li>♦ Configuressi</li></ul>	vable	k color left side	pane b Utili	' el		у	LI		/ARRANT	<b>'Y</b> 3



diskette • 4 • (5) • 6 • 7 • 8 • (9) Hot-swap

models only

Bay @ 5.25", HH 1.6", access, CD-ROM Bay @ 5.25", HH 1.6", access, open Bay @ 3.5", SL 1", access, diskette

Hot-swap models 6AX and 6BX:

Hot-swap models 6AX and 6BX: ♦ Handle grip on top Six bays ® to ® 3.5", SL 1", access, hot-swp ♦ H 18.4" x W 6.5" x D 26.0" Fixed disk models 62X:

Bay ⓐ 3.5", SL 1", no access, not hot-swap Bay ⑤ 3.5", SL 1", no access, not hot-swap Bay ⑥ 3.5", SL 1", no access, not hot-swap Bay ⑦ 3.5", SL 1", no access, not hot-swap

Maximum internal SCSI disk capacity13: 587.2GB (4 disks x 146.8GB) Fixed: Hot-swap: 880.8GB (6 disks x 146.8GB) ♦ BIOS Setup Utility via F1 at startup LSI Configuration Utility near startup by

pressing ČTRL+C ♦ DMI 2.2-compliant

Adv Config Power Interface (ACPI) 1.0a
 Device Driver and IBM Enhanced

Diagnostics CD-ROM included

♦ Four stabilizing feet

♦ H 467mm x W 165mm x D 660mm

44 to 57 pounds (20 to 25.8kg)

⇒ Fixed disk models: metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling

Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure l year parts and labo

International Warranty Service<sup>3</sup>

On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time

On site service upgrade options (in eligible locations):7

3 year IOR 9x5, NBD response (ServicePac® part num 96P2248)

3 year IOR 9x5, 4 hr avg response (ServicePac part num 96P2249) 3 year IOR 24x7, 4 hr avg response

(ServicePac part num 96P2250)

• 3 year IOR 24x7, 2 hr avg response
(ServicePac part num 96P2251)

→ Other ServicePac options at

http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information US models announced January 20, 2004

	· · · · · ·	(, tagaot 200 l				-	the Second	
IBM® Type-GAV-model Proc	L2 FSB essor GHz¹ cache MHz Memory	Disk	Disk controller			Power supply number and type		Available date
8648-00y-00x 1 x 2 8648-0Ay-0Ax 1 x 2 8648-0By-0Bx 1 x 2 8648-10Y-10x 1 x 2 8648-1AY-1Ax 1 x 2 8648-1BY-1Bx 1 x 2 8648-20Y-20x 1 x 2 8648-2BY-2Bx 1 x 2	Xeon     2.8     1MB     800     512MB       Xeon     2.8     1MB     800     512MB       Xeon     3.0     1MB     800     512MB       Xeon     3.0     1MB     800     512MB       Xeon     3.2     1MB     800     512MB       Xeon     3.2     1MB     800     512MB       Xeon     3.2     1MB     800     512MB	None (open-bay) None (open-bay) 80GB SATA 7200 None (open-bay) None (open-bay) 80GB SATA 7200 None (open-bay)	Ultra320 SATA Ultra320 Ultra320 SATA Ultra320	3 simple-swap 6 hot-swap 3 simple-swap 6 hot-swap 6 hot-swap 3 simple-swap 6 hot-swap 6 hot-swap 6 hot-swap 6 hot-swap	6 x 9 6 x 9 6 x 9 6 x 9 6 x 7 6 x 9	Two redundant One fixed One fixed Two redundant One fixed	Gigabit Si Gigabit Si Gigabit Si	ept 2004 ept 2004 ept 2004 ept 2004 ept 2004 ept 2004 ept 2004
Processor(s) SMP - L2 Cache Implementation	1 x Intel® Xeon up to 3.2 GHz wi 2-way SMP / up to two Xeon Prod Systemboard contains two Intel 60	cessors (same speed/	′cache`size)́	/ 1MB std and r	max / at	processor speed	ŭ	0,
Memory	<b>512MB</b> std / 16GB <sup>13</sup> max / two slo connector slots on systemboard / Error Checking and Correcting detects 2- through 8-bit errors cont	ts used / four slots ava DIMMs must be install (ECC) via 16-bit Che tained in two chips) av	ailable / <b>PC2</b> led in match cksum Chi vailable on 1	<b>2-3200</b> 400MHz E ned pairs [a bank] i <b>pkill</b> ™ (corrects 1 IGB (2x512) DIMI	ECC DDI / 2-way I, 2, 3, c M Kit an	R2-SDRAM DIMN memory interleav r 4-bit errors on s d greater	ls / Six 240 e / dual cha ame chip a	) pin gold- annel / and
SATA disk controller SCSI disk controller Cables RAID Controller	r Dual Channel SATA-150 contro <b>Adaptec® 7902</b> / <b>dual channel</b> ServeRAID 7e supports <b>RAID-</b> swap models: one 1-drop 16-bit 68 24P7929 from systemboard to rea One SCSI cable (listed above), tw IBM ServeRAID 7e (RAID 0 0r 1).	I Ultra320 SCSI cor D & 1 mirroring / Tv B-oin LVD SCSI cable	<b>ntroller</b> (L\ wo 16-bit ch to 6-bav ba	VD 320MB/sec) nannels (one inter ckolane: <i>Externa</i>	/ on pla nal and al channe	anar / 64-bit 100 one external) / <i>Int</i> el: cable available :	MHz PCI-: ernal chanr as option p	X / <i>nel:</i> Hot- n
Mechanical Bus slots (see below Chipset	4U <sup>4</sup> Tower (rack mount support vi ) One PCI-Express / three 64-bit (or Intel E7520 chipset / E7525 MCI- supports Adaptec 7902, 2 64bit/10 bit/33MHz PCI slots (slots 2 & 3),	ia tower-to-rack kit opt ne 133MHz, 2 100MH I (Memory Controller I 0MHz PCI-X slots (5 & video, SATA, 4xUSB(2	tion) Iz) PCI-X 1. Hub) for PC & 6), BUS E 2.0), Low Pi	0 / two 32-bit/33N CI-Express x16(vid 3 supports one 64 in Count Interface	//Hz / no d), Broad lbit/133M / NS PC	o hot-swap Active com, PXH, ICH5F IHz PCI-X slot (4) 287366 Super I/O	™ PCI slots R / PXH BL / ICH5R fo off LPC int	S JS A or two 32- erface
Ethernet CD-ROM / diskette Ports Diagnostics Systems mgmt cntrl	One gigabit 10/100/1000 ethernet chip on planar / PCI-X 64-bit 100M CD-ROM: 48X-20X <sup>6</sup> CD-ROM, ID Front: two USB (Ver 2.0); Back: monitor (analog DB-15) Diagnostic LEDs / error LEDs for Winbond <sup>6</sup> W791D / chip on plana support for optional Remote Su	E / <i>Diskette:</i> 3.5" 1.44 two USB (Ver 2.0), two fans and memory / se	MB diskette o serial (9-p erver diagno	e drive oin), parallel, keyb estic programs sto or temperature, far	oard, mo	ouse, ethernet (Ru BM Enhanced Dia and failure, and v	I-45), agnostics C	:D
Graphics controller	SVGA / ATI® Radeon™ 7000M on					g		
Security	Mechanical side panel key lock (Ichot-swap models) / optional U-Bolipower-on password / boot sequen without keyboard/mouse / security	t support via knockout ace control / operation	Xec (xe) (512	on 2.80 GHz/800/ on 3.00 GHz/800/ on 3.2 GHz/800/1 2MB (2x256) PC2	/1MB L2 MB L2 ( 2-3200 E	Cache EM64TPro Cache EM64TPro CC DDR2	oc Upg 1 c Upg 1 7	3N0671 3N0672 3N0673 73P3523
Software	ServerGuide™ (CD-based autom and configuration tool), IBM Direct software) and many utilities		allation 1G mgmt 2G	B (2x512) PC2-32 B (2x512) PC2-32 B (2x1GB) PC2-3 M 80GB SATA-15	200 ECC 3200 EC	C DDR2 ChipK DII C DDR2 DIMM K	MM Kit 7 it 7	73P3522 73P2865 73P2866 73P8002
Keyboard / mouse Cooling fans Power supply(s)	IBM 101 key keyboard / IBM mousup to six / three for processor(s), repower supply cage fans (three in call of the	memory, and disk bay dual power supply mod / all variable speed / not hot-swap / hot-swap / redundan   / Automatic Server	PS/2) IBM IBM IBM IBM IBM IBM IBM 40) IBM spd) IBM	M 160GB SATA-1 M 250GB SATA-1 M 36.4GB 15K Ultra M 73GB 10K Ultra M 146GB 10K Ultra K/12X/40X Max <sup>6</sup> ( M Remote Superv M 4U Extended D	50 (7.2k 50 (7.2k ra320 SC 320 SC ra320 SC CD-RW i risor Ada epth Tov	() simple-swap HI () simple-swap HI CSI Hot-Swap SL SI Hot-Swap SL Internal (black) pter II (PCI adapt wer-to-Rack Kit	DD 7 DD 7 HDD 0 IDD 3 HDD 3 er) 5	73P8003 73P8006 06P5776 032P0727 032P0728 02P6976 05P2984 06K6095
Slot 5: fullsize, 64-bit Slot 6: fullsize, 64-bit * support only for x8 ** slot for opt IBM Se	t/33MHz, PCI (5v) t/33MHz, PCI (5v) t 133MHz, PCI-X 1.0 (3.3v) t 100MHz, PCI-X 1.0 (3.3v)** t 100MHz, PCI-X 1.0 (3.3v) adaptors	pressing F1  ⇒ BIOS Setup  ⇒ Adaptec Co startup by p  ⇒ DMI 2.2-cor	IBN Oth Oth Oth I left side pa on/Setup Ut 1 at startup Outlity via F onfiguration pressing C1 mpliant	ility invoked by F1 at startup Utility near	SATA com/p m.com/p ⇒ 1 y ⇒ Int ⇒ Or	ntroller	RRANTY	



Bay 3 3.5", SL 1", access, diskette

Hot-swap models:

Six bays ⊕ to ⊚ 3.5", SL 1", access, hot-swp ♦ Four stabilizing feet Simple-swap models: 2 std, 2 avail(up to 4 \$\display \text{Handle grip on top} SATA HDDs maybe added with ServeRAID \$\display \text{H 18.4" x W 6.5" x D 25.9"}

7t controller) Bay <sup>@</sup> 3.5", SL 1", simple-swap Bay <sup>@</sup> 3.5", SL 1", simple-swap Bay <sup>@</sup> 3.5", SL 1", simple-swap Bay <sup>@</sup> 3.5", SL 1", fixed

Maximum internal disk capacity<sup>13</sup>: SATA: 500GB (2 disks x 250GB); 1TB (4 disks x 250GB) w/ ServeRAID 7t SCSI: 880.8GB (6 disks x 146.8GB)

♦ Adv Config Power Interface (ACPI) 1.0a Device Driver and IBM Enhanced

Diagnostics CD-ROM included

- ♦ H 467mm x W 165mm x D 658mm
- 44 to 57 pounds (20 to 25.8kg)
- Fixed disk models: metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

- Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):7
- 3 year IOR 9x5, NBD response (ServicePac® part num 96P2248) 3 year IOR 9x5, 4 hr avg response
- (ServicePac part num 96P2249)

  3 year IOR 24x7, 4 hr avg response
- Syear IOR 24x7, 4 III avg response (ServicePac part num 96P2250)

  3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2251)

  Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf

24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model Qty x F	L2 Processor cache	L3 cache Memory D	SCSI Pisk controller Mechan	Slots x bays ical (hot-swap bays	Power supply	Available Ethernet date
8671-KAX 1 x Xeon 8671-L1X 1 x Xeon 8671-LAX 1 x Xeon < 8671-M1X 1 x Xeon < 8671-MAX 1 x Xeon	2.67GHz 512KB 2.8BGHz 512KB 2.8BGHz 512KB 3.06GHz 512KB 3.06GHz 512KB	0MB 512MB N 0MB 512MB N 0MB 512MB N 0MB 512MB N 0MB 512MB N	one 2 x Ultra320 Towo one 2 x Ultra320 Towo	er 6x10 (6 hot-swap std er 6x10 (6 hot-swap std nally available with pur	; 9 max) 560W hot ; 9 max) 560W fixed ; 9 max) 560W hot ; 9 max) 660W fixed ; 9 max) 660W hot	Gigabit Jan 2004
Positioning Processor(s) L2 cache L3 cache SMP support Implementation	Up to 1 x Intel® > 512KB / all mode 1MB / available of 2-way SMP / up Systemboard con	Keon™ Processon  els / on die of processon  on some models a  to two Xeon Processon  ntains two Intel 6	or 3.06 GHz with 533Ml deessor / at processor s / on die of processor / a deessors (same speed/c 03-pin micro-PGA ZIF	t processor speed	r-Threading technolog	У
Memory	PC2100 266MHz DIMMs must be i 2x100MHz / Erro	registered 184-ր nstalled in match or Checking and	Correcting (ECC) (co		rors on same chip ar	nd detects 2-
SCSI channels	supports RAID-1 low-cost RAID 0, Two 16-bit chann interface for Bay devices via exterre Enhanced IDE A' None standard / s	mirroring with 1, 1E, 5, 00, 10, nels / SCSI Chan 8 and 9 (may re nal SCSI knockou TA-100 controlle supports 7200-15	up to one hot-spare dis 1E0, 50 (installed only nel A: 16-bit 68-pin LVI quire a cable) or with c ut in rear (cable req 32P r in CSB5 South Bridge 000 rpm disks / one bac	ntroller (LVD 320MB/sek / shared with optional in Slot 4) Coable from controller to ptional 3-Pack Kit (cab 8164) or via opt ServeRey one connector on play collane / all disk bays Ultrot-swap bays with Kit 3	I İBM ServeRAID™-6 to backplane; <i>Chann</i> le included); supports AID adapter with exte anar / one 1-drop IDE ra320-enabled	i Controller for lel B: 16-bit 68-pin s external SCSI limal connector(s) cable (CD-ROM)
Mechanical Chipset	Tower / conversion ServerWorks® G two CIOB-X2 I/O controllers; IMB2	on to or EIA 19" R rand Champion Bridges (IMB2 bu bus to Host Bridd	tack (5U⁴) via optional k ™ <b>4.0 LE</b> / CMIC LE Hos us to Host Bridge for PC ge for PCI-X 1.0 Bus C v	t for support in IBM NetE t Bridge (memory contro -X 1.0 Bus B with slots 2 ith slots 5 and 6) / CSB USB, SMBus, LPC bus	BAY™ Racks oller and I/O Bridge) / 2, 3, 4 and Ultra320 ar 5 South Bridge (Thin I	nd ethernet MB to Host Bridge
Ethernet controller CD-ROM / diskette Rear ports Front port / graphics	48X-20X <sup>6</sup> CD-RO Rear: two USB (V	M / IDE / 1.6" Hi ers 1.1), keyboard	H; <i>Diskette:</i> 3.5" 1.44M I, mouse, parallel, <b>two</b> se	CI-X 64-bit 100MHz / full d B diskette drive / dust c rial (9-pin),graphics (DB-1 on planar / 8MB SDRAM	over 5), ethernet (RJ-45), tv	vo RJ-45 (sys mgmt)
Security	Power-on passwo button / unattend			lockable front door to co		
Systems mgmt  Diagnostics  Software	H8S2148 / on pla monitoring such a supports optional connector on plar <b>Light Path Diagn</b> failing part (under	nar / provides sys as temp, optional Remote Supervis nar for continuous lostics™ panel pr side cover) / Infor CD-ROM installati	nent processor (ISMP) stem and environmental disks, fans, power supp sor Adapter with 20-pin s power (no ext pwr reqd oviding LED map to rmation LED Panel in from ion and configuration	Xeon 2.8BGHz/512 Xeon 3.06GHZ/512 2x256MB PC2100 I 512MB PC2100 CL2.5 1GB PC2100 CL2.5 2GB PC2100 CL2.5 IBM ServeRAID-61 IBM Remote Super	KB L2 Cache Proc U KB L2 Cache Proc U KB L2 Cache Proc U Non-Chipkill DDR-SD 2.5 ECC DDR-SDRAM 5 ECC DDR-SDRAM 5 ECC DDR-SDRAM 6 COT DDR-SDRAM 6 COT DDR-SDRAM 6 I CC DDR-SDRAM 6 I CC DDR-SDRAM 7 I CONTROLLER 8 I CONTROLLER 9 I CONT	pg 71P8967 pg 02R1988 RAM Kit 73P2868 M DIMM 33L5038 RDIMM 33L5039 RDIMM 33L5040 or slot 4) 71P8595 adapter) 59P2984
Keyboard/mouse Power supply	IBM 101-key key MAX: std/max: tw M1X: std/max: two Rest: std/max: on xAX:	ro/two 660 watt de/two 660 watt do/two 560 watt de/two 560 watt do blowers / varia	All: voltage-sensing / auto-restart / fan in each able speed / hot-swap /	36.4GB 15K-2 80 UI 3-Pack Ultra320 Hot IBM 560W Hot-Swa IBM 660W Hot-Swap Other options at iI	tra320 SCSI Hot-Swa t-Swap Expansion Kit ap Power Upgrade Ki Power Upgrade Kit (3. bm.com/pc/us/acces atible with 400Mhz FSE	up SL HDD 06P5776 33P2751 t* 02R1874 06 Only) 02R2015 sories
5.25" HH 5.25" HH CD-ROM	MHz 5v PCI 2.2, B DMHz 3.3v PCI-X, DMHz 3.3v PCI-X, DMHz 3.3v PCI-X, SMHz 3.3v PCI-X, SMHz 3.3v PCI-X, SMHz 3.3v PCI-X, SMHz 3.5v PCI-X, DTI IBM ServeRAID (1) 3.5", SL 1", (2) 3.5", SL 1", (3) 3.5", SL 1", (4) 3.5", SL 1", (5) 3.5", SL 1",	Bus A not hot, Bus B not hot, Bus B* hot-swap, Bus C hot-swap, Bus C co-si Controller access, hot-swar access, co-swar	<ul> <li>Quick release adapt</li> <li>Configuration/Setup pressing F1 at startu</li> <li>LSI Logic Configura by pressing CTRL+I</li> <li>Diagnostics (PC-Doo F2 at startup</li> <li>ACP12.0-compliant</li> <li>Operator Information</li> <li>Predictive failure an memory, processor supplies, and fans in Director can alert the of an imminent comp</li> <li>Tower: H 17.31" x</li> <li>74 to 101 pounds</li> <li>Stealth black color</li> </ul> All models: Max interest	Utility invoked by price of the provided by processing to the processing of the process of the	24 hr x 7 day co 4 hour average (ServicePacpar     24 hr x 7 day co 2 hour average (ServicePacpar     24x7¹⁴ toll-free su      24x7¹⁴ toll-free su	abor ranty Service <sup>3</sup> om, Mon - Fri ng holidays, next ponse time <sup>7</sup> ranty service (in eligible e, ing holidays, response art num 21P2083) overage, response tnumber 21P2084) overage, response tnumber 21P2085)

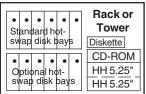
IBM® Type-model Qty	L2 x Processor cache Memory Disk co	SCSI ontroller Mechanical	Slots x bays (hot-swap bays)	Power supply	Available Ethernet date								
	(eon® 2.8GHz 1MB 512MB None 2)	Ultra320 Tower 6x10	(6 hot-swap std; 9 max	x) 1 x 670W hot-swap	2xGigabit Aug 2004								
			) (6 hot-swap std; 9 ma; ) (6 hot-swap std; 9 ma;	/	2xGigabit Aug 2004 2xGigabit Aug 2004								
8841-31ý-31x 1 x X			(6 hot-swap std; 9 max (6 hot-swap std; 9 max		2xGigabit Aug 2004 2xGigabit Aug 2004								
8841-41y-41x 1 x X			(6 hot-swap std; 9 max										
Positioning Processor	Universal server; two-way server using Up to 1 x Intel® Xeon™ Processor 2.												
	(EM64T) / Simultaneous Multi-threa	iding (SMT) / Hyper-Thre		ous / Exterioed Memor	y 64 Technology								
L2 cache SMP support	1MB / all models / on die of processor 2-way SMP / up to two Xeon Processor		size)										
Implementation	Systemboard contains two Intel 604-p six PCI slots (one hot-swap Active™ F	in micro-PGA ZIF socket	s. eÍaht memorv aold-co	onnector DIMM slots,									
Memory	512MB or 1MB std / 16GB max / two				CC DDR2-SDRAM								
Welliory	DIMMs / DIMMs must be installed in n	natched pairs [a bank] / 2	-way memory interleave	/ dual channel / memo	ry bus runs at								
	2x200MHz / Error Checking and Co errors contained in two chips) / Activ												
	optionally available, requiring 512ME												
SCSI disk controller	Adaptec AIC 7902 / dual channel UI HostRAID supports RAID-0, 1 mirror												
0001	low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10	, 50 (installed on internal o	connector)										
SCSI channels	Two 16-bit channels / SCSI Channel B: 16-bit 68-pin LVD cable from controller to backplane; Channel A: 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI												
IDE controller / cable	knockout in rear (cable req 32P8164)	or via opt ServeRAID ad	apter with external conn	ector(s)									
Disk - capacity	Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)  None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled  Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks												
Disk - bays	· · ·			•	pm disks								
Mechanical Slots	Tower / conversion to EIA 19" Rack ( Two PCI-Express (one hot-plug), three												
Chipset (see below)	Intel E7525 chipset / Intel E7525 Me (slots 2 & 3) / PXH: Bus A, two 64-bit/	mory Controller Hub (MC	H): PXH, ICH5R, Duál E	Broadcom ethernet, two	PCI-Express x8 slots								
	6) / ICH5R: one 32-bit/33MHz slot (slo												
Ethernet controller	Dual 10/100/1000 gigabit / Broadcom®	BCM 5721 / on planar / I	PCI-X 64-bit 100MHz / fu	ull duplex / Wake on LA	N® / Alert Standard								
CD-ROM / diskette	Format (2.0) / IPMI (1.5) 48X-20X <sup>6</sup> CD-ROM / IDE / 1.6" HH; I	Diskette: 3.5" 1.44MB disk	cette drive / dust cover										
Rear ports	Rear: two USB (Vers 2.0), keyboard,	mouse, parallel, one seri	al (9-pin), graphics (DB-1	15), two ethernet (RJ-4	5), RJ-45 (sys mgmt)								
Front port / graphics Security	Power-on password / administrator pa		•										
	unattended boot / selectable boot	Soword / Tilliged and look	able from door to cover	aior bays, power batto	n, and reset batter 7								
Systems mgmt	IBM Integrated system managemen		Xeon 2.8GHz/1MB L2 Xeon 3.4GHz/1MB L2		13N0681								
	H8S2148 / on planar / provides syster monitoring such as temp, optional disk	ks, fans, power supp /	Xeon 3.6GHZ/1MB L2	Cache Proc Upg	ne Proc Úpg 13N068								
	supports opt. Remote Supervisor Adap 20-pin connector on planar for continu		512MB (2x256) PC320 1GB (2x512) PC3200										
Diamantin	(no ext pwr reqd)		1GB (2x512) PC3200 (	CL3 ECC DDR2 RDIN	1M 73P2865								
Diagnostics	<b>Light Path Diagnostics</b> <sup>™</sup> panel prov failing part (under side cover) / Informa		2GB (2x1GB) PC3200 73.4GB 10K Ultra320 S										
Software	front ServerGuide™ (CD-ROM installation		146.4GB 10K Ultra320 36.4GB 15K Ultra320 S	SCSI Hot-Swap SL HI	DD 32P0728								
Soliware	utilities), IBM Director, others	and configuration	73.4GB 15K Ultra320 S	SCSI Hot-Swap SL HDI	D 32P0735								
Keyboard / mouse	IBM 101-key keyboard / IBM mouse (		IBM ServeRAID-7k Co IBM Remote Superviso		71K8642 73P9341								
Power supply Fans	std/max: one/two 670 watt / voltage-se Fan in each std/max: four/six/ two fans		IBM T541 15" Flat Pan	el Color Monitor (black)	9512AB1								
	planar, (Opt) two fans (rear) / variable	speed / hot-swap /	3-Pack Ultra320 Hot-Si IBM 670W Hot-Swap F		33P2751 25K9560								
	redundant with optional rear fans / F fan in each power supply	TA/	Other options at www										
Slot 1: half-length. 3	32-bit 33MHz 5v PCI 2.2, Bus A	Quick release adapte	r slots (no screws)	LIMITED W									
Slot 2: full, PCĬ-Exp	oress x8, Bus B	Configuration/Setup L	Itility invoked by ´	<ul><li>3 year parts and I</li><li>International War</li></ul>									
	00MHz 3.3v PCI-X, Bus D	pressing F1 at startup		On site, 8 am - 5	om, Mon - Fri								
Slot 5: full, 64-bit 10	00MHz 3.3v PCI-X, Bus D 33MHz 3.3v PCI-X, hot-swap, Bus E	by pressing CTRL+I	orTM) by proceing	coverage excludi business day res	ng holidays, next								
Siot o. raii, OT bit To	20 12 0.00 1 01 A, Hot Swap, Dus L	F2 at startup	o. Juy pressing	3 year on site war	ranty service								
Bay	y ① 3.5", SL 1", access, diskette y ② 3.5", SL 1", access, hot-swap	<ul><li>⇒ ACPI 2.0-compliant</li><li>⇒ Operator Information</li></ul>	Panel (in front)	upgrade options locations):7	(in eligible								
5.25" HH   "   Ray	/ ③ 3.5" SI 1" access hot-swan	Predictive failure ana	lysis on disk options,	<ul> <li>9 hour coverage</li> </ul>									
5.25" HH   #   Bay	/ @ 3.5", SL 1", access, hot-swap / @ 3.5", SL 1", access, hot-swap	memory, processors, supplies, and fans in	conjunction with IBM	Mon-Fri exclude 4 hour average									
CD-ROM Bay	y 6 3.5", SL 1", access, hot-swap	Director can alert the of an imminent compo		(ServicePac® pa	ırt num 21P2083)								
• ② Bay	/ ® 3.5", SL 1", access, hot-swap / ® 3.5", SL 1", access, hot-swap / ® 5.25", HH 1.6" access, open**	□ Tower: H 17.31" x W		<ul> <li>24 hr x 7 day c</li> <li>4 hour average</li> </ul>									
• • Bay	y 9 5.25", HH 1.6" access, open** y 0 5.25", HH 1.6" access, CD-ROM	<ul><li>⇒ 74 to 101 pounds</li><li>⇒ Stealth black color</li></ul>		(ServicePac par	number 21P2084)								
5	ys 2 through 7 support 6 SL disks			<ul> <li>24 hr x 7 day c</li> <li>2 hour average</li> </ul>									
• 🔻 via	SCA-2 connectors.	All models: Max int of 1.2TB <sup>2</sup> with nine 146.		(ServicePac par	t number 21P2085)								
	ays 8 and 9 support three 3.5" isks via 3-Pack Kit 33P2751	3-Pack Ultra160 Hot-S			warranty period <sup>3</sup>								
		•		•									

Din (0 501 V01	xSeries™ 25	o (Julie		XHEF By es	erver Field 5	kills Enablem	ent ream	
IBM® Type-model Qty x	L3 Processor cache	Memory	ECC memory features	Disk	SCSI controller	Mech- Slots x d anical bays (s	lisk bays std/max) Ethernet	Available date
8685-71X 1 x Xeon 8685-7RX 1 x Xeon ≈ 8685-72X 2 x Xeon ≈ 8685-73X 2 x Xeon ≈ 8685-81X 1 x Xeon ≈ 8685-8RX 1 x Xeon ≈ 8685-9RX 1 x Xeon ≈ 8685-9RX 1 x Xeon	MP 2.0GHz 1MB MP 2.0GHz 1MB MP 2.0GHz 1MB MP 2.5GHz 1MB MP 2.5GHz 1MB MP 2.8GHz 2MB	512MB Ho 1GB Ho 1GB Ho 1GB Ho 1GB Ho	ot Spare/Chipkill	None None None 2 x 36.4GB 10K None None None None	2 x Ultra160 2 x Ultra160 2 x Ultra160 2 x Ultra160 2 x Ultra160	Rack 7 x10 Tower 7 x10 Tower 7 x10 Tower 7 x10 Rack 7 x10 Tower 7 x10	6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit	Jun 2003 Nov 2003 Nov 2003 Jun 2003 Jun 2003 Jun 2003
Processors L2 cache L3 cache Processor upgrade Implementation	1 or 2 x Intel® Xec 512KB / on die of p 1MB or 2MB / on di 4-way SMP / up to Systemboard conta one PCI slot, and in	rocessor / at le of process four Xeon Pr ains four Inte	t processor speed sor / at processor s rocessors MP (sar I 603-pin micro-PC	speed ne speed/cache GA ZIF sockets, o	size)	,,	Ů	nnology
Memory	Up to <b>3GB</b> std / 24 184-pin ECC DDR installed in matche of a pair or quad o <b>mirroring</b> (memor <b>Chipkill</b> ™ (corrects	-SDRAM DI d pairs or q f DIMMs [a y mirroring	MMs'/ one memoudds [a bank] / 2-bank]; reqs additionsupported with a	orý-board std wit or 4-way memo onal memory ma ny OS) / <b>Error</b>	h 12 DIMM gold-co pry interleave / <b>Ho</b> atching failed bank <b>Checking and Co</b>	onnector slots t Spare Memo () / Active Memorrecting (ECC)	/ DIMMs mus ory (activated l mory™ via me C) via 16-bit (	t be by failure emory Checksum
SCSI disk controller SCSI connectors IDE controller / cablir Disk - capacity Disk - bays	Adaptec® AIC-7899 Channel B: 68-pin Channel A: 68-pin g Enhanced IDE ATA None (or two) stan Std: six hot-swap di	connector or connector or a-100 control dard / supp	n planar to SCSI ba n planar for optiona ller in CSB5 South orts up to 15,000	ackplane (one-dr al one-drop 16-bii Bridge / one one rpm disks / 80-	op 16-bit LVD cable : LVD cable (32P81 -drop IDE cable fro pin SCA-2 connec	e) / 64) to rear 0.8i om IDE controll tors	mm VHDCI cor er to CD-ROM	nnector
Mechanical Rack / conversion Architecture / chipset	two CIOB-X I/O Bri ethernet and one P SMBus, IOAPIC, L ) Six hot-swap PCI-X	oorted in IBM and Champ dges (IMB b PCI 2.2 bus fo PC bus to S ( 1.0 slots <sup>10</sup>	M NetBAY™ racks ion™ 4.0 HE / CM bus to Host Bridge or SCSI / CSB5 S uper I/O) / five pe available with pov	/ kit available to IC Host Bridge ( , one with two Poouth Bridge (Thier PCI buses / Nower and attention	convert tower to ra Memory Controller CI-X buses C and I n IMB to Host Bridg S PC87417 Super indicator lights (op	ack (use NetBar and I/O Bridga D, other with o ge, one PCI 2.2 I/O (diskette, Potical sensors o	AY11 for rack te) and five REI ne PCI-X bus I bus A, EIDE, keyboard, moucontrol power t	MCs / B and USB, ise)
Ethernet controller CD-ROM / diskette Rear ports Graphics controller	not replace, hot u 10/100/1000 gigabi CD-ROM: 48X-20X Four USB (Vers 1.1 two RJ-45 (for integ SVGA / ATI® Rage	t ethernet / E 6 CD-ROM, ), one serial rated systen	Broadcom® BCM 5 IDE (ATAPI), 1.6" (9-pin), keyboard n management pro	703 / on PCI Bus HH, bootable / <i>E</i> (PS/2), mouse (F ocessor) / no para	B / full duplex / Wa Diskette drive: 3.5" 1 PS/2), ethernet (RJ- allel port	ake on LAN® / A 1.44 MB diskett -45), graphics (	Alert Standard I te drive, dust c (DB-15),	cover
Security	Power-on passwor button (tower only)	d / administr	ator password / h	inged and lockal				
Systems management Diagnostics Software		stem manag ar / provides be temp, option emote Supe r for continuo stics™ pane op cover) / In D-ROM instal	gement processo system and enviro nal disks, fans, po rvisor Adapter with ous power (no extre el providing LED m formation LED Pa llation and configu	r (ISMP) / inmental wer supplies / n 20-pin ernal power req) ap to nel in front	512MB PC1600 ECC DDR SDRAM RDIMM   33L3   13   13   14   15   15   15   15   15   15   15			
Keyboard / mouse Power supply Fans	Tower only: IBM 10 Std: two 370 watth redundant with four universal (voltage s Nine hot-swap red variable speed / PF	03-key keybo not-swap; <i>M</i> power supp sensing) / far lundant fans	pard / IBM mouse ax: four 370 watt lies / tool-free inst as in each power s s / plus fan in each	not-swap / ´all / upply / PFA power supply/	IBM External SCSI Media Bay Cable In IBM ServeRAID™ IBM 36.4GB 10K IBM 73.4GB 10K IBM Remote Supul IBM T541 15" Flat Other options at	Kit (2-drop SCŠ)  -4H Ultra160 Ultra160 SCS Ultra160 SCS ervisor Adapte t Panel Color N	I to HH bays) SCSI Adapte SI Hot-Swap SI SI Hot-Swap SI r II Monitor (black)	L 06P5755
Standard hotswap disk bays  Bay ① 3.5", SL 1" Bay ② 5.25", HH 1. Bay ③ 5.25", HH 1. Bay ③ 5.25", HH 1. Bays 5 to 10 (six bays)  Bays 11 to 16 (six bays)	CD-ROM HH 5.25" HH 5.25"  , access, diskette 6" access, CD-ROM 6" access, open* 6" access, open* 6" access, open* 1" hot-swap disk bay	04 to 150 lb color .0 e compo- ind labels e hot-swap is oduct Data o BIOS	primarily fo Slot 2: full, 64-bit 1 Slot 3: full, 64-bit 1 Slot 3: full, 64-bit 1 Slot 5: full, 64-bit 1 Slot 5: full, 64-bit 1 Slot 6: full, 64-bit 1 Slot 7: full, 64-bit 1 Slot 8-bit 1 Slot 8-bit 1 Slot 8-bit 1 Slot 9-bit 1 S	rfor optional Rem 00MHz 3.3v PCI-00MHz 3.v PCI-00MHz 3.3v PCI-00MHz 3.v PCI-00MHz 3.3v PCI-00MHz 3.v PCI-00	ote Supervisor Adp X, hot-swap, Bus B X, hot-swap, Bus B X, hot-swap, Bus C X, hot-swap, Bus C X, hot-swap, Bus C X, hot-swap, Bus C bessing F1 at by pressing elect Utility s from top ts generated tor for DIMM(s),	⇒ 3 year par ⇒ Internation ⇔ On site, 8 coverage business of ⇒ On site se (in eligible • 3 year IC (ServiceP • 5 year IC (ServiceP • 5 year IC (ServiceP ⇒ Other ServiteP http://www.its/pdf/war ⇒ 24x714 toll-	nal Warranty S am-5 pm, Mon excluding holi day response ervice upgrade e locations): <sup>7</sup> DR 9x5, 4 hr at Pac part num 3 DR 9x5, 4 hr at Pac part num 60 vicePac option w.ibm.com/ser momxeu.pdf free support fressues during to	Service <sup>3</sup> i-Fri idays, next time <sup>7</sup> options  vg resp. 41L2738) avg resp 1L2723) vg resp. 9P9223) is at rvices/us/ or

See footnotes for important warranty information • = Hot-swap US models announced June 2003 or November 2003

<sup>(</sup>X255C) © IBM Corp. November 2003

IBM <sup>®</sup> Type-model Qty x P		L3 ache Memory	ECC memory features	Disk	SCSI controller		Slots x di bays (s	sk bays std/max) Etherne	Available date
8685-A1X 1 x Xeon <sup>10</sup> 8685-ARX 1 x Xeon   8685-B1X 1 x Xeon   8685-BRX 1 x Xeon   8685-C1X 1 x Xeon   8685-C1X 1 x Xeon   8685-TEX 2 x Xeon	MP 2.2GHz 21 MP 2.7GHz 21 MP 2.7GHz 21 MP 3.0GHz 41 MP 3.0GHz 41	MB 512MB MB 1GB MB 1GB MB 1GB MB 1GB	Hot Spare/Chipkill™ Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill	None None None None None 3 x 73GB - 10k	2 x Ultra160	Rack Tower Rack Tower Rack	7 x10 7 x10 7 x10 7 x10 7 x10	6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit 6/12 Gigabit	Mar 2004 Mar 2004 Mar 2004 Mar 2004 Mar 2004
Processors L2 cache L3 cache Processor upgrade Implementation	512KB / on die 1MB, 2MB or 4-way SMP / u Systemboard of	e of processo 4MB / on die p to four Xeon contains four Ir	or MP 2.0, 2.2, 2.7, or / at processor spe of processor / at pro Processors MP (san tel 603-pin micro-PC SCSI, ethernet, graph	ed ocessor speed ne speed/cache s 3A ZIF sockets, o	size)		,,	C	inology
Memory	184-pin ECC I installed in ma of a pair or qua mirroring (me	DDR-SDRAM atched pairs of ad of DIMMs emory mirrorin	x / 512 &1GB: two s DIMMs / one memor r quads [a bank] / 2- [a bank]; reqs additing ng supported with a or 4-bit errors on sa	ory-board std with or 4-way memo onal memory ma ony OS) / <b>Error (</b>	n 12 DIMM gold- ry interleave / <b>H</b> otching failed ban <b>Checking and C</b>	connect ot Spar ık) / Act orrecti	or slots a e Memo tive Men ng (ECC	/ DIMMs mus ory (activated nory™ via m c) via 16-bit (	t be by failure emory Checksum
SCSI disk controller SCSI connectors IDE controller / cabling Disk - capacity Disk - bays	Channel B: 68- Channel A: 68- gEnhanced IDE 7EX: 3 x 73GE	-pin connector -pin connector E ATA-100 cor B - 10K / supp	Itra160 SCSI (LVD 1 or on planar to SCSI bar on planar for optiona ntroller in CSB5 Sou ports up to 15,000 rp max: six additional bar	ackplane (one-droal one-droal al one-drop 16-bit th Bridge / one o om disks / 80-pin	op 16-bit LVD cab LVD cable (32P8 ne-drop IDE cab SCA-2 connecto	ole) / 3164) to le from ors	rear 0.8n IDE con	nm VHDCI cor troller to CD-F	nnector ROM
Mechanical Rack / conversion Architecture / chipset	Rack systems ServerWorks two CIOB-X I/O ethernet and o SMBus, IOAPI Six hot-swap F	supported in Grand Char  Bridges (IMI)  PCI 2.2 bu  C, LPC bus to  CI-X 1.0 slots	r / tower models have IBM NetBAY™ racks npion™ 4.0 HE / CMB bus to Host Bridge is for SCSI / CSB5 S o Super I/O) / five per 10 available with power of expansion / sep	./ kit available to IIC Host Bridge (None with two PC outh Bridge (Thir er PCI buses / NS ver and attention	convert tower to Memory Controlle CI-X buses C and IMB to Host Brid S PC87417 Supe indicator lights (c	rack (user and I/I D, other dige, one of I/O (dieprical s	se NetBA O Bridge er with or e PCI 2.2 skette, k ensors c	AY11 for rack e) and five RE ne PCI-X bus bus A, EIDE eyboard, mou	MCs / B and USB, ise)
Ethernet controller CD-ROM / diskette Rear ports Graphics controller	CD-ROM: 48X Four USB (Ver two RJ-45 (for i	-20Xº CD-ROI s 1.1), one ser integrated sys	t / Broadcom® BCM 5 M, IDE (ATAPI), 1.6" rial (9-pin), keyboard tem management pro anar / 8MB SDRAM	HH, bootable / Di (PS/2), mouse (Pocessor) / no para	<i>iskette drive:</i> 3.5" 'S/2), ethernet (R ıllel port	1.44 MI J-45), g	B diskette raphics (	e drive, dust o DB-15),	cover
Security			istrator password / h led boot / selectable l		le front door to co	over dis	k bays, p	ower button,	and reset
Systems managemen  Diagnostics  Software	t IBM integrated H8S2148 / on p monitoring suc supports option connector on p Light Path Dia failing part (und	d system mar planar / provide ch as temp, op nal Remote Su planar for contil agnostics™ pa der top cover) M (CD-ROM ins	nagement processo es system and enviro tional disks, fans, po ipervisor Adapter with nuous power (no exte anel providing LED ma / Information LED Pa stallation and configu	r (ISMP) / wnmental wer supplies / n 20-pin ernal power req) ap to nel in front ration	512MB PC1600 1GB PC1600 E0 2GB PC1600 E0 Xeon MP 2.0GH Xeon MP 2.5GH Xeon MP 2.8GH 6-pack Ultra320 370 watt Hot-Sv IBM 7U x 26D To	CC DDF CC DDF Iz/1MB Iz/1MB Iz/2MB Hot-Sv vap Rec ower-to-F	R SDRAI R SDRAI L3 Cach L3 Cach L3 Cach vap Expa dundant Rack Cor	M RDIMM M RDIMM e Proc Upg e Proc Upg ansion Kit Power Suppl version Kit III	32P1474
Keyboard / mouse Power supply Fans	Std: two 370 w redundant with universal (volta Nine hot-swap	vatt hot-swap; I four power su age sensing) / D redundant fa	yboard / IBM mouse Max: four 370 watt I pplies / tool-free insta fans in each power s ans / plus fan in each lure signals diagnost	(both black) hot-swap / all / upply / PFA power supply/ ic LED	IBM External SCS Media Bay Cable IBM ServeRAID IBM 36.4GB 10I IBM 73.4GB 10I IBM Remote Su IBM T541 15" FI Other options a	Kit (2-dı ™-4H L K Ultra1 K Ultra1 pervisor at Pane	rop SCSI Iltra160 60 SCS 60 SCS Adapter I Color M	to HH bays) SCSI Adapte I Hot-Swap S I Hot-Swap S II Ionitor (black)	L 06P5755 L 06P5756 59P2984
⇒Tower dim: H15.5"; ⇒Rack dim: H12.0";	x W17.6" x D27.			r for optional Remo	ote Supervisor Ad X, hot-swap, Bus	B ⇒ Int	ear parts	ED WARRAN s and labor al Warranty So um-5 pm. Mon-	ervice <sup>3</sup>



- Black color ACPI 1.0
- Orange components and labels indicate hot-swap options
- ⇒ Vital Product Data
- Backup BIOS
- Bay ① 3.5", SL 1", access, diskette Bay ② 5.25", HH 1.6" access, CD-ROM Bay ③ 5.25", HH 1.6" access, open\* Bay ④ 5.25", HH 1.6" access, open\* Bays 5 to 10 (six bays):

standard 3.5" SL 1" hot-swap disk bays Bays 11 to 16 (six bays): optional 3.5" SL 1" hot-swap disk bays

startup; Diagnostics (PC-Doctor) by pressing F2 at startup; CTRL+A for SCSISelect Utility Removeable top cover

 Access adapters, memory, CPUs from top
 Predictive Failure Analysis<sup>®</sup>: alerts generated by mgmt processor for IBM Director for DIMM(s), processor(s), VRM(s), power supply(s), disk(s), and fans

Slot 4: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C

Slot 5: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C Slot 6: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D

Slot 7: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D

 $\Rightarrow$  Setup Program is available by pressing F1 at

Maximum internal disk capacity: 880GB2 with twelve 73.4GB SL hot-swap SCSI disks

- On site, 8 am-5 pm, Mon-Fri coverage excluding holidays, next
- business day response time On site service upgrade options
  - (in eligible locations):<sup>7</sup>
     3 year IOR 9x5, 4 hr avg response
  - (ServicePac® part num 41L2738)

     3 year IOR 24x7, 2 hr avg resp (ServicePac part num 31L2723)
    • 5 year IOR 9x5, 4 hr avg response
  - (ServicePac part num 69P9223)
- http://www.ibm.com/services/us/ its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

See footnotes for important warranty information

= Hot-swap

L2

FSB

Memory

**IBM**<sup>®</sup>

Ethernet

Limited Available

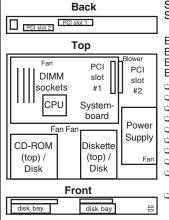
Slots

Type-model Qty	x Processor	cache	MHz	Memory	type	Disk	controlle	r bays	anical	x bays	5	warranty	<sup>3</sup> date
8673-72X Pentiu 8673-73X Pentiu 8673-82X Pentiu 8673-83X Pentiu	m 4 2.8BGH m 4 3.06GH	z 512KB z 512KB	533 533	256MB 256MB	ECC ECC ECC	40GB EIDE 18.2GB SCSI 40GB EIDE 36.4GB SCSI	Ultra160 ATA-100	2 fixed 2 fixed	1U rack	2x4 2x4	2 x Gigab 2 x Gigab 2 x Gigab 2 x Gigab	it 1 year it 1 year	May2003 Sep 2003
Positioning Processor(s) L2 cache SMP support Implementation	Intel® P 512KB No SMP Systeml	entium 4 on die support ooard co	4 up to of pro- ntains	to 2.8BGH ocessor / a one Intel n	<b>z</b> <sup>1</sup> with 5 t process nPGA478	k-optimized serv 33MHz frontside sor speed (no L BB socket (with F PCI-X slot, and i	bus (FS 3 cache) Pentium 4	FC-PGA	2 and heat two EIDE	sink), fo	our memory ctors, etherr	<sup>,</sup> DIMM sl net, and ς	lots, graphics
Memory	DIMMs	four DI	MM g	jold-connec	ctor slots	three slots ava on systemboar nemory controlle	d / memo					CC DDR	-SDRAM
SCSI disk control	er SCSI m					gle channel Wier / one channel				MB/sec	)/		
SCSI connectors IDE disk controlle Cables	r Enhanc SCSI m EIDE m	odels: ( ed IDE b odels: ( odels: (	On acusma one 2- one 2-	dapter: one ster / ATA- -drop 16-bi -drop EIDE	e 68-pin 100 sup t LVD SC cable (t	SCSI connecto port / two connects CSI cable, one 1 o CD-ROM and	r ctors on s -drop 40- disk), one	ystembo conducto e 1-drop E	ard r EIDE cal EIDE cable	e (to se	cond disk b	ay)	,
Disk - features						rpm, 5.2ms read							.M.A.H.I.°
Mechanical Architecture / chip Bus slots	osets <b>Server\</b> one CIC CSB5 S Nationa	<b>Vorks® (</b> B-X2 I/C outh Brid I Semico	Granc D Bridg dge (T Induct	I Champio ge (IMB bu hin IMB to tor® PC874	n™ SL / s to Hos Host Bri 14 Supe	supports 16.75 CMIC-SL (Supe t Bridge for PCI- dge for PCI 2.2- r I/O chip (serial hot-swap Active	r Lite) Ho -X Bus A v based gra , keyboar	st Bridge with slots aphics co d, mouse	(memory and PCI-) ntroller, E	control X Bus E IDE, US	ler and I/O I 3 with dual 6	Bridge) / ethernet)	
CD-ROM / disket Rear ports Front ports / grap Console intercon	on plana e 24X-100 Rear: s nics Front: t	ar / PCI-X (° CD-R( erial (9-p wo USB	( 64-b DM / II bin), tv (Vers	it 100MHz DE; <i>Disket</i> vo ethernet 1.1); <i>Grap</i>	Bus B / fi te: 3.5" 1 (RJ-45), hics: SV		/ Wake or drive / dus e, analog XL / on pl	n LAN® / A st cover DB-15 m anar / 8M	Nert Stand onitor / no B SDRAM	ard For parallel l std/ma	mat 1.0 / tw port	o rear R	J-45 ports
Systems mgmt Diagnostics	Diagnos	tics via l	PC-Do	octor on a s	standard	s system and pr IBM Enhanced onn on planar fo	Diagnosti	cs CD (di	skette car	be cre	ated) / supp	ort for or	
Security Software	unatten Server(	deḋ boot <b>≩uide</b> ™ (	/sele		t / unatte ation and	vord / nded start mode I configuration	5 51 10 12	12MB PC 3B PC21 20GB AT	2100 CL2 00 CL2.5 I A-100 EII	.5 ECC ECC DI DE HDI	DDR-SDR DDR-SDR DR-SDRAM D (7200 rpi	AM DIMN /I RDIMM m)*	M33L5038 I 33L5039 09N4231
Cooling fans Power supply Prerequisites	power s 200 wat Monitor	upply) / v t / univer keyboa s IBM A	/ariab sal / a rd, mo	le speed / i luto-sensin buse, rack, AT-5 chair	not redur g / auto- operatin		ap 36 R R S IB IB IB	3.4GB 15I 3.4GB 10I emote Su erveRAIE M T541 - M NetBA M NetBA M ACT I ther optic	C Ultra160 C Ultra160 Ipervisor A IPM-4Lx Ult I5" Flat Pa LY25 Stand LY42 Ente Local Con	SCSIS SCSIS dapter ra160S anel Co dard Ra erprise sole Ma com/po	SCSI Adapt lor Monitor ack Rack	D* D* ter (black)	06P5765 06P5766 06P5752 09N7585 06P5740 9512AB1 9306250 930842S 1735L04

Disk

Disk

Mech-



Slot 1: halfsize, 64-bit 133MHz PCI X 1.0 (3.3v) Slot 2: halfsize, low-profile, 64-bit 133MHz PCI X 1.0 (3.3v) - SCSI adapter in some models

std diskette std CD-ROM no access, std fixed disk no access, open for fixed disk

Raven black front bezel

- H 1.72" (1U) x W 17.3" x D 16.75"; 43.7mm x 439.9mm x425.5mm
- 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration) Configuration/Setup Utility: F1 at startup
- Optional System Partition: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- SCSISelect near startup by pressing CTRL+A (SCSI models) Ships with Diagnostics CD, ServerGuide Setup and Installation
- CD, and IBM Director CD, and Broadcom Ethernet CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

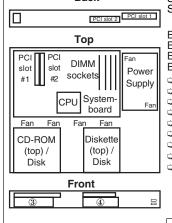
Maximum internal disk capacity<sup>13</sup> (model dependent): 146.8GB with two 73.4GB SL SCSI disks or 240GB with two 120GB EIDE disks / supports 15K rpm SCSI disks

- 1 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, NBD avg response (ServicePac® part num 69P9505)

    3 year IOR 9x5, 4 hr avg response
- (ServicePac part num 69P9506) 3 year IOR 24x7, 4 hr avg response
- (ServicePac part num 69P9507)
- 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9508) 

  → Other ServicePac options at
- http://www.ibm.com/
- services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

For GAV systems, lowercase "x" should be replaced with a country-specific code.														
IBM	® Mach		Processor	L2	FSB	Memory	Disk	Disk controller	Disk bays	Mech- anical	Slots x bays	Ethernet	Ltd warr <sup>3</sup>	Available date
8836 8836	2Mx 2Sx 3Mx	15X 21X 25X 31X	Pentium 4® 2.8GHz Pentium 4 2.8GHz Pentium 4 3.0GHz Pentium 4 3.0GHz Pentium 4 3.2GHz Pentium 4 3.2GHz	1MB 1MB 1MB 1MB 1MB 1MB	800 800 800 800	512MB 512MB 512MB 512MB	36.4GB SCSI open bay 36.4GB SCSI open bay 36.4GB SCSI open bay	SATA Ultra320 SATA	2 simple-swap 2 fixed 2 simple-swap	1U rack 1U rack 1U rack	2x4 2x4 2x4 2x4	Dual Gb Dual Gb Dual Gb	1 yr 1 yr 1 yr 1 yr	Apr 2004 Jun 2004
L2 cad SMP s	ssor(s	ť	A highly affordable, Intel® Pentium 4 to 1MB / on die of pr No SMP support Systemboard contariser for two PCI-X	ip to 3 ocesso ains on	. <b>2GH</b> : or / at e Inte	<b>z</b> 1 with 8 process el mPGA	:00MHz frontsid :or speed (no L :478B socket (v	e bus (FS 3 cache) vith Pentiu	um 4 FC-PGA2 a					
Memo	ory		512MB std / 4GB registered 184-pin 2 x 166MHz / Erro	ECC [	DR-9	SDRAM	DIMMs / four E	DIMM gold	d-connector slots	on syste	mboar	d / memo	ry bus	runsat
SCSI IDE di Cable	conne isk cor s	itroller	SCSI models: Or Enhanced IDE bus SCSI models: on SATA models: two	PCI ad PCI a smaste e 2-dro o 1-dro	dapte dapte r / A p 16- p SA	r / one c er: one 6 TA-100 s bit LVD TA cable	channel with up 18-pin SCSI con 18-pin SCSI con 19-port / one of 19-port /	to 15 develonector connector ne 1-drop EIDE cal	vice support / Int on systemboard EIDE cable (co ble (connected to	tegrated finected to CD-RO	Raid <sup>*</sup> 7	e (Raid 0-	1)	
Disk - features  SCSI: 36.4GB Ultra320 SCSI, 10K rpm, 4.7ms read seek, S.M.A.R.T.5; SATA: open bay;  Mechanical  Architecture / chipsets Intel E7210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse  Bus slots  Ethernet controllers  Two gigabit 10/100/1000 ethernet ports / Intel Kenai II / two full gigabit ethernet MAC and PHY layer functions / on planar/														
Etherr CD-R Rear p Front	om / doorts		, ,	0/1000 ( ort two 1 / IDE: ), two e 'ers 2.0	ethern is PC ; <i>Dis</i> ethern )); <i>G</i>	net ports I 2.2 / fu kette: 3. et (RJ-4! raphics:	/ Intel Kenai II Ill duplex / PXE / 5" 1.44MB disk 5),keyboard, mc SVGA / ATI® F	/ two full of two	gigabit ethernet M LAN® / Alert Stand / dust cover og DB-15 monito 000 / on planar /	dard Form or / no par 18MB D	at 2.0 / allel po DR SE	two rear f ort / two U	RJ-45 SB (V	ports ers 2.0)
	ms m		On planar / monite Diagnostics via PC Remote Superviso	-Docto	r on a	ı standar	d IBM Enhance	d Diagno:	stics CD (diskette	can be c			for op	tional
Secur	•		Power-on passwor unattended boot / s <b>ServerGuide™</b> (CI utilities), IBM Direc	electab D-ROM	ole bo insta	ot / unati llation ar	tended start mo	de 5	256MB PC2700 C 512MB PC2700 C IGB PC2700 CL2	L2.5 ECC .5 ECC DI .5 ECC DI	DDR-S DR-SD DR-SD	SDRAM DI RAM DIMI RAM DIMI	MM VI	06P4053 06P4054 06P4055 06P4051
Powe	ng fans r supp quisite	oly	Six fans (four fans / variable speed / / universal / auto- Monitor, keyboard	not red sensing	lunda j / au	nt or ho	t-swap 300 wa rt support	tt 37	BOGB SATA simpleOGB SATA simpleOGB SATA simpleOGB SATA simpleOGB 10K Ultra 33.4GB 10K Ultra 146.4GB 1	pple-swap 320 SCSI 320 SCSI 320 SCSI 320 SCSI or Adapt Ultra320 ATA Con Standard Enterprise Console N	HDD SL 68 SI SL 68 SI SL 6 er II SCSI troller Rack Rack Manage	`(7200 rpr -pin HDD* -pin HDD* 8-pin HDD Adapter er is/accesso	ń)* *	73P8002 73P8003 32P0723 32P0724 32P0725 59P2984 13N2190 71P8648 9306250 930842S 1735L04
		Back	0.01.				MHz PCI X 1.0	(3.3v)	0 (2 2)		INAITE	D WADD	ANIT	<b>V</b> 3



Slot 1: 3/4 size, 64-bit 66MHz PCI X 1.0 (3.3v) Slot 2: half size, low-profile, 64-bit 66MHz PCI X 1.0 (3.3v)

std CD-ROM std diskette no access, std fixed disk no access, open for fixed disk

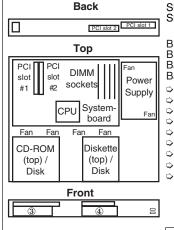
- Raven black front bezel
- ⇒ H 1.72" (1U) x W 17.3" x D 20"; 43.7mm x 439.9mm x 508mm ⇒ 26 to 28 lbs; 11.8kg to 12.7kg (minimum to max configuration) ⇒ Configuration/Setup Utility: F1 at startup

- Network Boot: F12 at startup
- Operator Information Panel in front
- SCSISelect near startup by pressing CTRL+A (SCSI models)
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity<sup>13</sup> (model dependent): 292.8GB with two 146.4GB SL SCSI disks or 320GB with two 160GB EIDE disks / up to 15K rpm SCSI disks

- 1 year parts and labor
   International Warranty Service<sup>3</sup>
   On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time7 On site service upgrade
  - options (in eligible locations):<sup>7</sup>
     3 year IOR 9x5, NBD avg response (ServicePac® part num 69P9505)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9506)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9507)
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9508)
- Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

For CAV systems laweress	"u" abould be replaced with	o o o untru	oposific codo						1000	-	the sales and		
For GAV systems, lowercase  IBM® Machine Type GAV model	Processor	L2	FSB MHz Mem	orv Disk	Disk controller	Disk bavs	Mech- anical	Slots x bays	Ethernet	Ltd warr			
8836 - 4My -41x P 8836 - 4Sy -45x P 8836 - 5My -51x P	Pentium 4® 3.2GHz Pentium 4 3.2GHz Pentium 4 3.4GHz Pentium 4 3.4GHz	1MB 1MB 1MB	800 512M 800 512M 800 512M	36.4GB 3 open bay 3 36.4GB	SCSI Ultra320 SATA SCSI Ultra320	2 fixed 2 simple-swap	1U <sup>4</sup> rac 1U rac 1U <sup>4</sup> rac	ck 2x4 k 2x4 ck 2x4	Dual Gb Dual Gb Dual Gb	1 yr 1 yr 1 yr	Aug 2004 Aug 2004 Jan 2005		
Positioning Processor(s) L2 cache SMP support Implementation	A highly affordable intel® Pentium 4 1MB min and man No SMP support Systemboard cont PCI-X slots, and in	at 3.2Ġ x / at p tains or	iHz¹ & 3.40 rocessor s ne Intel PG	Hz with 800 beed / ECC A604 socke	OMHz FSB optim t (with Pentium	4 FC-PGA2 and	heatsink	s), four	memory [	DIMM	,		
Memory	512MB std / 4GB DIMMs / four DIM Correcting (ECC)	IM gold	-connector	slots on sys									
SCSI disk controller SATA disk controller Cables Disk - features	one channel with	up to 1 er (150 ismaste ne 2-dro o 1-dro	5 device s MB/sec) / c er / ATA-10 pp 16-bit L pp SATA c	upport / Inte in planar / o 00 support / VD SCSI ca ables, one 1	egrated Raid 7e ne connector on one connector able, one 1-drop I-drop EIDE cat	(Raid 0-1) / 68 p systemboard / In on systemboard EIDE cable (cor ble (connected to	in conn tegrated nnected CD-RC	ector of Raid 7 to CD- OM)	n PCI ada 7e (Raid 0 ·ROM)	apter	dapter /		
Mechanical Architecture / chipsets Bus slots	EIA 19" Rack (1U Intel E7210 chips EIDE, ethernet Ma parallel, serial, ke (See below) two a	s <b>et</b> / Me AC, US yboard,	emory Con B, Low Pin mouse	roller Hub (I Count Inter	face / Firmware	Hub / SMSC® LP	°C47M1	92 Sup					
Ethernet controllers  CD-ROM / diskette Rear ports Front ports / Graphics	Dual Gigabit 10/1 integrated / port of ports (2) 24X-10X <sup>6</sup> CD-ROI <i>Rear:</i> serial (9-pir <i>Front:</i> two USB ( SVGA / ATI® Rad	ne is Co M Slim/ n), two e Vers 2.	SA, port tw IDE; <i>Disk</i> ethernet (R 0)	b is PCI 2.2 ette: 3.5" 1. J-45),keyboa	/ full duplex / PXI 44MB diskette c ard, mouse, anal	E / Wake on LAN® Irive / dust cover og DB-15 monitor	/ Alert S	tandard	Format 2.0	) / Rea	ar RJ-45		
Console interconnects	s No system-to-sys	tem int	erconnect	cable (sepa	rate keyboard,	video, mouse po	orts on	back)					
Systems mgmt Diagnostics	On planar / monit Diagnostic LEDS/ Diagnostics CD (o planar for continu	′ Error I diskette	LEDS for for can be cr	ans and me eated) / sup	mory/ Diagnosti port for optional r required)	cs via PC-Doctor Remote Superv	r on a s isor Ada	apter II	with 20-p	in cor	nn on		
Security Software		selecta wr on/c D-ROM	able boot / off via ASF // installati	unattended 2.0 on and conf	start mode / 18	250GB SATA sim	.3 ECC I ECC DD ble-swap ple-swa ple-swa	DDR-SE R-SDR. HDD p HDD p HDD	ORAM DIM AM DIMM (7200 rpn (7200 rpi ) (7200 rpi	M n) m) m)			
Cooling fans Power supply Prerequisites	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others  Six fans (four fans for system, two on power supply) / variable speed / not redundant or hot-swap 300 watt / universal / auto-sensing / auto-restart support Monitor, keyboard, mouse, rack, operating system  160GB SATA simple-swap HDD (7200 rpm) 73P8003 250GB SATA simple-swap HDD (7200 rpm) 73P8006 36.4GB 10K Ultra320 SCSI SL 68-pin HDD 32P0723 36.4GB 10K Ultra320 SCSI SL 68-pin HDD 32P0724 36.4GB 15K Ultra320 SCSI SL 68-pin HDD 32P0725 36.4GB 15K Ultra320 SCSI SL 68-pin HDD 32P0785 Remote Supervisor Adapter II 59P2984 ServeRAID™-6i+ Ultra320 SCSI Adapter ServeRAID™-6i+ Ultra320 SCSI Adapter ServeRAID™-6i+ Ultra320 SCSI Adapter ServeRAID™-71P8648 IBM NetBAY25 Standard Rack 9306250 Other options avail at www.ibm.com/pc/us/accessories												



Slot 1: half size, 64-bit 66MHz PCI X 1.0 (3.3v) Slot 2: half size, low-profile, 64-bit 66MHz PCI X 1.0 (3.3v)

std CD-ROM std diskette no access, std fixed disk no access, open for fixed disk

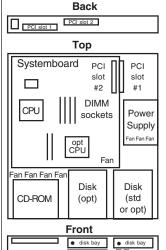
- Raven black front bezel
- ⇒ H 1.72" (1U) x W 17.3" x D 20"; 43.7mm x 439.9mm x 508mm ⇒ 26 to 28 lbs; 11.8kg to 12.7kg (minimum to max configuration) ⇒ Configuration/Setup Utility: F1 at startup

- Network Boot: F12 at startup
- Operator Information Panel in front
- SCSISelect near startup by pressing CTRL+A (SCSI models)
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity<sup>13</sup> (model dependent): 292.8GB with two 146.4GB SL SCSI disks or 500GB with two 250GB SATA disks / up to 15K rpm SCSI disks

- 1 year parts and labor
   International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time7 On site service upgrade
  - options (in eligible locations):<sup>7</sup>
     3 year IOR 9x5, NBD avg response (ServicePac® part num 69P9505)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9506)
  - 3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 69P9507) 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9508)
- Other ServicePac options at http://www.ibm.com/
- services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

	IBM® Type-model Qty x Prod	cessor	Proc. Speed	L2 Cache	Memory	Memory type	Disk	Disk controller	Hot -swap or fixed disk bays	Slots x bays	Ethernet		Available date
<b>*</b>	8835-21X 1 x Optero 8835-22X 1 x Optero 8835-31X 1 x Optero 8835-32X 1 x Optero 8835-51X 1 x Optero 8835-52X 1 x Optero 8835-52X 2 x Optero	on™ 240 on 240 on 242 on 242 on 246 on 246 on 246	1.4Ghz <sup>1</sup> 1.4Ghz 1.6Ghz 1.6Ghz 2.0Ghz 2.0Ghz 2.0Ghz	1MB 1MB 1MB 1MB 1MB 1MB 1MB	1GB 1GB 1GB 1GB 1GB 1GB 2GB	Chipkill Chipkill Chipkill Chipkill Chipkill Chipkill Chipkill		Ultra320 EIDE Ultra320 EIDE Ultra320 EIDE Ultra320	2 hot-swap 2 fixed 2 hot-swap 2 fixed 2 hot-swap 2 fixed 2 hot-swap	2x3 2x3 2x3 2x3 2x3 2x3 2x3 2x3	2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit	1 year 1 year 1 year 1 year 1 year 1 year 1 year	Oct 2003 Oct 2003 Oct 2003 Oct 2003 Oct 2003 Oct 2003 Oct 2003
	Processor(s) L2 cache SMP support Implementation	1MB / or 2-way SI Systembo	n die of pro M <b>P</b> / up to oard conta	cessor two C ins two	r / at prod opteron Po o AMD S	cessor spe rocessors ocket 940	nz HyperTransp eed (no L3 cac (same speed/o micro-PGA ZIF MD Opteron H	he) cache size = sockets,	required) six memory D				·
	Memory	slots used SDRAM I memory in	d (four slots DIMMs / six nterleave /	used ir DIMM dual ch	n 5DX mo gold-conr annel / m	del) / four s nector slots emory bus	s become availa slots available (to s on systemboard runs at 2 x 1001 errors on same of	wo avail. in d / DIMMs MHz / <b>Errc</b>	5DX) / PC2700 must be installed or Checking an	333MH d in ma <b>d Corre</b>	Iz registered tched pairs [acting (ECC)	184-pin a bank] / via <b>16-b</b>	ECC DDR- 2-way iit
	SCSI disk controller  IDE controller / cable  Disk - capacity  Disk - bays	64-bit 10 one 16-b All: Enha EIDE mo SCSI mo	OMHz PCI it internal onced IDE onced IDE once onced IDE once oncedels: 36.40	-X Bus channe ATA-10 2-drop GB sup	B / supports / 16-bit / 16-bit / 100 control of EIDE control ports up / 100 control /	orts <b>RAID-</b> 68-pin LVI ler in CSB able to tw to 15000 r	C1020 / Ultra3 1 mirroring (Ei D cable from sy 5 South Bridge o disk bays (pi pm disks; EIDE pronectors / filler	mbedded   stemboard / two conr rimary) / d : <i>models:</i> 8	Mirroring) with d to backplane nectors on plan one 1-drop EID 30GB / 7200 rp	two SC for two ar / one E cabl m / AT	SI disks in fr disks / no ex 1-drop IDE e to CD-RO A-100 / 8.7m	ont bay ternal c cable (0 M (secons seek	onnector CD-ROM) ondary)
	Mechanical Architecture / chipsets Bus slots	SAMD® 81 bridge B HyperTra National	I <b>31 PCI-X</b> for PCI-X ansport clo Semicond	<b>Bridge</b> expan ock (PC uctor®	e Chip p sion slots I, AC '97 PC87366	roviding tv s) / <b>8111</b> 7, Etherne 3 Super I/0	<b>I/O HyperTran</b> t, SMBus, USE	es running <b>sport Bri</b> 3, EIDE, L	g at 100Mhz (t dge Chip sup PC to BIOS a	oridge A porting	A for SCSI a a 200 Mhz	nd Ethe	ernet;
	Ethernet controllers CD-ROM/diskette/kbd Rear ports Front ports / graphics Console interconnects	on plana 24X-10X <sup>6</sup> <i>Rear:</i> tw <i>Front:</i> tw C2T Inte	r / PCI-X 6 CD-ROM O USB (Vero USB (Vero USB)	4-bit 10 / IDE ers 1.1) rs 1.1); cablin	00MHz B / <i>Diskette</i> , serial (9 <i>Graphics</i> g not sup	us B / full e and keyl e-pin), two e: SVGA / A eported / N	ethernet (RJ-45 ATI® Rage XL / o	on LAN® / SB diskett 5) / paralle on planar / 8	<ul> <li>Alert Standard e and keyboard l port not supp</li> <li>BMB SDRAM st</li> </ul>	d Forma d option orted d/max /	at 1.0 / two r nal); legacy 32-bit 33MHz	eár RJ- not sup z PCI 2.2	45 ports ported 2 Bus A
	Systems mgmt  Diagnostics	connecto Adapter Diagnosi	MS-9549 r on plana Il card not tic LEDs fo tht Path Di	r / opti suppo or fans	onál Rem rted , memory	note Super / DIMMs a		Optero Optero 512ME 1GB F	on 240 Proces on 242 Proces on 246 Proces 3 PC2700 CL2.5 CC2700 CL2.5 CC2700 CL2.5	sor Up sor Up ECC D ECC DI	ograde ograde DDR-SDRAM DR-SDRAM	RDIMM	73P2267
	Security Software	unattend ServerG		selecta D-ROM	ble boot I installat	/ unattend ion and c	rd / led start mode onfiguration	80GB 120GE 36.4GI 73.4GI	ATA-100 EIDE 3 ATA-100 EID B 15K Ultra320 B 15K Ultra320	E HDD* E HDD SCSI I SCSI I	* Hot-Swap SL Hot-Swap SL	_ HDD* _ HDD*	09N4226 09N4231 32P0734 32P0735
	Cooling fans Power supply Prerequisites	variable 411 watt	speed / no / universa	ot redu al / aut	ndant or o-sensing	hot-swap g / auto-re	ver supply) / estart support e), operating s	IBM S USB F NetBA NetBA 1.5M L	otalStorage F0 erveRAID-6M Portable Disker Y ACT Local Y Remote Co JSB Conversion	SCSI ( tte Driv Console nsole N n Optio	256MB Cac e e Manager ( Manager (RC n	he) LCM)	24P0960 02R0988 05K9276 1735L04 1735R16 73P5832



Disk not supported in all e325 systems Slot 1: half-length, 64-bit 100MHz PCI X 1.0 (3.3v); Bus C Slot 2: full-length, 64-bit 100MHz PCI X 1.0 (3.3v); Bus C

Bay © 5.25", UltraSlim 0.5", access, std CD-ROM Bay ② 3.5", SL 1", access, std fixed or hot-swap disk Bay ③ 3.5", SL 1", access, open for fixed or hot-swap disk

- Stealth black color front bezel
- Utility tray in front slides out from under middle bay (USB devices)
- H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)

- Configuration/Setup Utility: F1 at startup System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity<sup>13</sup> (model dependent): 293.6GB with two 146.8GB SL SCSI disks or 240GB with two 120GB EIDE disks

#### **LIMITED WARRANTY**<sup>3</sup>

- 1 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time7
- On site service upgrade options (in eligible locations):7
  - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9399)
  - 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2119)

    2 year IOR 24x7, 2 hr avg response
- (ServicePac part num 96P2120)

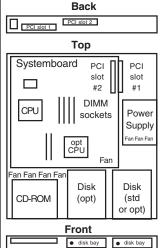
  3 year IOR 24x7, 4 hr avg response
- (ServicePac part num 69P9507)
- 3 year IOR 9x5, NBD response (ServicePac part num 69P9506)
  Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

See footnotes for important warranty information

= Hot-swap in some models

(X325A) © IBM Corp. August 2003

IBM® Type-model Qty x Pro	ocessor	Proc. Speed	L2 Cache	Memory	Memory type	Disk	Disk controlle	Hot -swap or r fixed disk bays	Slots x bays	Ethernet v		Available date
8835-61X 1 x Opter 8835-62X 1 x Opter 8835-71X 1 x Opter 8835-72X 1 x Opter	on™ 248 on 248 on 250	2.2Ghz <sup>1</sup> 2.2Ghz 2.4Ghz 2.4Ghz	1MB 1MB 1MB 1MB	1GB 1GB 1GB 1GB	Chipkill Chipkill Chipkill Chipkill	None (open) 80GB <sup>2</sup> EIDE None (open) 80GB EIDE	Ultra320 EIDE	2 hot-swap 2 fixed	2x3 2x3 2x3	2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit	1 year 1 year 1 year	Jan 2004 Jan 2004 Jun 2004
Processor(s) L2 cache SMP support Implementation	1MB / on 2-way SM Systemboa	die of pro IP / up to ard conta	ocesso two C ains two	r / at proo opteron P o AMD S	cessor spe rocessors ocket 940	eed (no L3 ca (same speed micro-PGA Z	che) /cache siz IF sockets	ology / 64-bit x re required) s, six memory l bus interface				
Memory	PC2700 33 be installed	33MHz re d in match <b>and Corr</b>	gistered ed pairs <b>ecting</b>	l 184-pin l s [a bank] <b>(ECC)</b> via	ECC DDR- / 2-way me . <b>16-bit C</b> h	-SDRAM DIMN emory interleav	ls / six DIN e / dual cha	al / two slots use //M gold-connect annel / memory acts 1, 2, 3, or 4	tor slots o	on systemboa at 2 x 100MH	ard / DIM Hz / <b>Erro</b>	r
SCSI disk controller	64-bit 100	MHz PCI	-X Bus	B/suppo	orts <b>RAID</b> -	1 mirroring (	Embedded	l Mirroring) with	two SC	SI disks in fr	ont bays	
IDE controller / cable	e <i>All:</i> Enhan	ced IDE	ATA-10	00 control	ler in CSB	5 South Bridg	ė / two cor	rd to backplane nnectors on pla one 1-drop Ell	nar / one	1-drop IDE	cable (C	D-ROM)
Disk - capacity Disk - bays	SCSI mod	lels: 36.40	GB sup	ports up	to 15000 r	pm disks; <i>EID</i>	E models:	80GB / 7200 r n each disk bay	pm / ATA	\-100 / 8.7m	s seek	• •
Mechanical Architecture / chipset Bus slots	s <b>AMD® 813</b> bridge B f HyperTrar National S	<b>31 PCI-X</b> for PCI-X nsport clo Semicond	Bridge expan ock (PC luctor®	e Chip p sion slots N, AC '97 PC87366	roviding tv s) / <b>8111</b> 7, Etherne 3 Super I/	wo PCI-X brid <b>I/O HyperTra</b> t, SMBus, US	ges runnir <b>nsport B</b> i B, EIDE,	ridge Chip sup LPC to BIOS a	bridge A porting	for SCSI a a 200 Mhz	nd Ethe	rnet;
Ethernet controllers CD-ROM/diskette/kbd Rear ports Front ports / graphics Console interconnect	on planar d 24X-10X <sup>6</sup> Rear: two s Front: two s C2T Interd	/ PCI-X 6 CD-ROM ) USB (Ve ) USB (Ve connect™	64-bit 10 1 / IDE ers 1.1) ers 1.1); 1 cablin	00MHz B / <i>Diskette</i> , serial (9 <i>Graphics</i> g not sup	us B / full e <i>and key</i> e-pin), two :: SVGA / <i>F</i> eported / N	duplex / Wake board: none (I ethernet (RJ- ATI® Rage XL /	e on LAN® JSB diske 45) / parall on planar / Console M	lel port not sup / 8MB SDRAM s	rd Forma rd option oorted std/max / 3	it 1.0 / two r ial); legacy i 32-bit 33MHz	eár RJ-4 not supp 2 PCl 2.2	15 ports ported Bus A
Systems mgmt  Diagnostics	Standard connector Adapter II Diagnositio only / Ligh	on plana card not c LEDs f	ar / Rer suppo or fans	note Sup rted , memory	ervisor / DIMMs a	nent / and processor	Opte 512M s 1GB 2GB	ron 248 Proce ron 250 Proce IB PC2700 CL2. PC2700 CL2.5 PC2700 CL2.5	ssor Up 5 ECC D ECC DI ECC DI	grade DR-SDRAM DR-SDRAM	RDIMM	73P2267 73P2269
Security	Power-on					rd / ded start mode	1200	B ATA-100 EIC	DE HDD*		1100*	09N4226 09N4231
Software		ide™ (C	D-ROM	l installat	ion and c	configuration	73.40	GB 15K Ultra32 GB 15K Ultra32 TotalStorage F	0 SCSI F	Hot-Swap SL	. HDD*	32P0735
Cooling fans Power supply Prerequisites	variable s 411 watt /	pèed / no universa	ot redu al / aut	ndant or o-sensing	hot-swap g / auto-re	ver supply) / estart support e), operating	IBM USB NetB sys, NetB 1.5M	ServeRAID-6N Portable Diske AY ACT Local AY Remote Co USB Conversi k not supported	I SCSI (2 ette Drive Console onsole M on Option	256MB Cac e Manager ( Ianager (RC	he) LCM) CM)	02R0988 05K9276 1735L04 1735R16 73P5832



Slot 1: half-length, 64-bit 100MHz PCI X 1.0 (3.3v); Bus C Slot 2: full-length, 64-bit 100MHz PCI X 1.0 (3.3v); Bus C

Bay © 5.25", UltraSlim 0.5", access, std CD-ROM Bay ② 3.5", SL 1", access, std fixed or hot-swap disk Bay ③ 3.5", SL 1", access, open for fixed or hot-swap disk

- Stealth black color front bezel
- Utility tray in front slides out from under middle bay (USB devices)
- → H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm
   → 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)

- Configuration/Setup Utility: F1 at startup System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity<sup>13</sup> (model dependent): 293.6GB with two 146.8GB SL SCSI disks or 240GB with two 120GB EIDE disks

## LIMITED WARRANTY<sup>3</sup>

- 1 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time7
- On site service upgrade options (in eligible locations):7
  - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9399)
- 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2119)

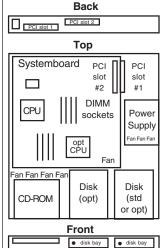
  2 year IOR 24x7, 2 hr avg response
- (ServicePac part num 96P2120) 3 year IOR 24x7, 4 hr avg response
- (ServicePac part num 69P9507)
- 3 year IOR 9x5, NBD response (ServicePac part num 69P9506)
  Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

See footnotes for important warranty information

= Hot-swap in some models

(X325B) © IBM Corp. January 2004

IBM® Type-GAV Qty x Proc		roc. L	2 he Memory	Memory type	Disk	Disk controller	Hot -swap or fixed disk bays		Ethernet	Limited warranty	Available date
8848-51Y 1 x Optero 8848-52Y 1 x Optero 8848-61Y 1 x Optero 8848-62Y 1 x Optero 8848-71Y 1 x Opteror 8848-72Y 1 x Opteror	n 246 2.0 n 248 2.2 n 248 2.2 n 250 2.4	Ghz <sup>1</sup> 1M Ghz 1M Ghz 1M Ghz 1M Ghz 1M Ghz 1M	B 1GB B 1GB B 1GB B 1GB	Chipkill Chipkill Chipkill Chipkill Chipkill Chipkill	None (open) 80GB <sup>2</sup> SATA None (open) 80GB SATA None (open) 80GB SATA	SATA	2 hot-swap 2 fixed 2 hot-swap 2 fixed 2 hot-swap 2 fixed	2x3 2 2x3 2 2x3 2	2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit	1 year 1 year 1 year 1 year	Sept 2004 Sept 2004 Sept 2004 Sept 2004 Sept 2004 Sept 2004
Processor(s)	Up to 2 x A compatible	MD® Opte	eron™ 246,	<b>248</b> , <b>250</b> v	vith 800Mhz Hy	/perTransp	ort technology	/ 64-b	it x86 Instru	uction set	/ 32-bit
L2 cache SMP support Implementation	1MB / ECC 2-way SMP	/ up to tw	o Opteron F	rocessors	sor speed (no I (same speed/o micro-PGA ZIF net, graphics / /	cache size	required) eight memory ron HyperLink	DIMM bus in	slots, two 6 terface	64-bit 133	3/100Mhz
Memory	1GB std / 16 PC2700 or I DIMMs must 100MHz / C	t be install	ed in matche	enabled v I-pin ECC ed pairs [a	vith uni-process DDR-SDRAM I bank] / 2-way I	or, eight w DIMMs / e memory in	vith dual / two ight DIMM gol terleave / dual	slots us d-conne channe	sed / six slo ector slots o el / memory	ots availa on systen bus runs	ble / nboard / s at 2 x
SCSI disk controller  SATA controller/cable Disk - capacity Disk - bays	64-bit 100Ml one 16-bit in All: SATA-15 SCSI model	Hz PCI-X ternal cha 50 controll s: open; S s: two hot-	Bus B / supp nnel / 16-bi er / two conr <i>ATA models</i>	oorts <b>RAID</b> t 68-pin L\ nectors on :: 80GB / 7	53C1020 / Ultra D-1 mirroring (I /D cable from s planar / two 1- 200 rpm / ATA- connectors / fille	Embedded systemboa drop cable -100 / 9.0r	Mirroring) witl rd to backplan s / 1 IDE ns seek	n two S e for tw	CSI disks in a disks in a disks / no	n front ba externa	ys / I connector
Mechanical Architecture/chipsets Bus slots	National Ser	niconaucto elow) two	available P0	Super I/C	ported in 26" de o PCI-X bridges Transport Brid , SMBus, USB, ) chip full-length, 1 H						
Ethernet controllers	Two gigabit	10/100/10	00 ethernet	oorts / Bro	adcom BCM570	04C / two 1	ull gigabit ethe	ernet M	AC and PH	Y layer fu	inctions /
Optical/diskette/kbd Rear ports Front ports / graphics Console interconnects	<i>Rear:</i> two ل <i>Front:</i> two ل C2T Intercor	JSB (Vers JSB (Vers nnect™ ca	1.1), serial 1.1); <i>Graph</i> bling not su	(9-pin), two hics: SVGA oported / N	adcom BCM570 duplex / Wake board: none (US o ethernet (RJ-4 A / ATI® Rage X NetBay Local Co are supported	on LAN® / SB diskette 15) / parall L / on plar onsole Ma	Alert Standard e and keyboar el port not sup nar / 8MB SDF nager (LCM),	d Forma d option ported AM std NetBay	at 1.0 / two hal); legacy l/max / 32-b r Remote C	rear HJ-4 not supp it 33MHz onsole M	PCI 2.2 anager
Systems mgmt	Standard MS connector or				nent /		on 246 Proces				13N0705 13N0706
Diagnostics	Adapter II ca	ard not su _EDs for f	oported ans, memor	y DIMMs a	and processors	Optero 2GB F	on 250 Proces C2700 CL2.5 C3200 CL3 E	sor Up ECC D	oğrade DR-SDRAN		13N0700 13N0702 73P2269 73P3233
Security	Power-on pa	assword /	administrato	r password	d /	80GB	SATA-150 7.2 3 SATA-150 7.	k HDD	*		25R6902 25R6903
Software	ServerGuide utilities), IBM	e™ (CD-R I Director	OM installat and other	ion and cos	ed start mode onfiguration	36.4G 73.4G	B 15K Ultra32 B 15K Ultra32	0 SCSI 0 SCSI	Hot-Swap	SL HDD*	32P0734 32P0735
Cooling fans	Eight fans (f				er supply) /		otalStorage F0 erveRAID-6M				24P0960 02R0988
Power supply Prerequisites	variable spe 411 watt / u Monitor, key	niversal /	auto-sensing	ı / auto-res	start support ), operating sys	S, USB F NetBA NetBA	Portable Disket AY ACT Local of AY Remote Co JSB Conversion Inot supported	tte Drive Console nsole M on Opti	e Manager Manager (R0 on	(LCM) CM)	05K9276 1735L04 1735R16 73P5832



Slot 1: half-length, 64-bit 133/100MHz PCI X 1.0 (3.3v); Bus C Slot 2: full-length, 64-bit 133/100MHz PCI X 1.0 (3.3v); Bus C

Bay © 5.25", UltraSlim 0.5", access, std CD-ROM

Bay ② 3.5", SL 1", access, std fixed or hot-swap disk Bay ③ 3.5", SL 1", access, open for fixed or hot-swap disk

- Stealth black color front bezel
- Utility tray in front slides out from under middle bay (USB devices)
- → H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm
   → 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

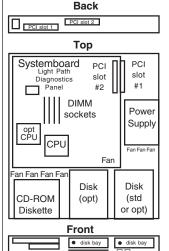
Maximum internal disk capacity<sup>13</sup> (model dependent): 293.6GB with two 146.8GB SL SCSI disks or 320GB with two 160GB EIDE disks

- 1 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time7
- On site service upgrade options (in eligible locations):7
  - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9399)
- 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2119)

  2 year IOR 24x7, 2 hr avg response
- (ServicePac part num 96P2120)

  3 year IOR 24x7, 4 hr avg response
- (ServicePac part num 69P9507)
- 3 year IOR 9x5, NBD response (ServicePac part num 69P9505)
  Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model Qty x P	rocessor	L2 cache	FSB MHz	Memory	Memory type		Disk controller	Hot -swap or fixed disk bays		Ethernet	Limited warranty	
8830-11X 1 x Xeon 8830-12X 1 x Xeon 8830-21X 1 x Xeon 8830-22X 1 x Xeon	2.8B GHz 2.8B GHz 3.06 GHz 3.06 GHz	512KB 512KB 512KB 512KB	533 🖾 533 🖾 533 🖾 533 🖾	512MB 512MB 512MB 512MB	Chipkill Chipkill Chipkill Chipkill	None (open) 40GB <sup>2</sup> EIDE None (open) 40GB <sup>2</sup> EIDE	Ultra320 EIDE Ultra320 EIDE	2 hot-swap 2 fixed 2 hot-swap 2 fixed	2x4 2x4 2x4 2x4 2x4	2 x Gigab 2 x Gigab 2 x Gigab 2 x Gigab	it 1 vear	May 2003 May 2003 Apr 2003 May 2003
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel 512KB / 2-way SI Systemb	Xeon 2.8 on die of pour betreeholden. MP / up to to ard contains	BB or 3. rocessor wo Xeor ins two I	.06GHz <sup>1</sup> r / at proc n Process ntel 603-	with 533Nessor spe sors (same pin micro-	erver that delive MHz frontside I ed (no L3 cach e speed/cache PGA ZIF socke thernet, graphi	bus / Hype ie) size) ets, four me	er-Threading to	echnolo	gy		
Memory	PC2100 : must be i Error Ch	266MHz re nstalled in	gistered matched d Corre	l 184-pin d pairs [a <b>cting (E</b> (	ECC DDF bank] / 2- CC) via 16	o slots availabl R-SDRAM DIMI way memory ir i-bit Checksun chips)	Ms / four D nterleave /	dual channel /	memory	/ bus ruńs a	t 2 x 100N	ЛHz/
SCSI disk controller  IDE controller / cable  Disk - capacity Disk - bays	64-bit 10 one 16-b All: Enha EIDE mo SCSI mo	OMHz PCI it internal o nced IDE o dels: One odels: none	-X Bus E channel ATA-100 2-drop E standa	3 / suppo / 16-bit 6 0 controll EIDE cab rd / suppe	rts <b>RAID-</b> 58-pin LVI er in CSB le to two o orts up to	C1020 / Ultras 1 mirroring (E 2 cable from sy 5 South Bridge disk bays / one 15000 rpm dis connectors / f	mbedded vstemboar e / two con 1-drop El ks; <i>EIDE r</i>	Mirroring) with d to backplane nectors on plar DE cable to CI models: 40GB	two SC for two nar / one D-ROM / 7200 rp	CSI disks in disks / no e e 1-drop IDE pm / ATA-10	front bays external co E cable (0 00 / 8.7m	onnector CD-ROM) s seek
Mechanical Architecture / chipsets Bus slots	s <b>ServerW</b> one CIOI slot 2 and SMBus, I	<b>/orks® Gra</b> 3-X2 I/O B d Ultra320 LPC bus to	ind Cha ridge (IN / CSB5 Super I	mpion™ //B2 bus South B I/O) / Nat	<b>4.0 LĖ</b> / 0 to Host Br ridge (Thi ional Sem	orted in 26" dee CMIC LE Host I ridge for PCI-X n IMB to Host I niconductor® P swap Active™ F	Bridge (me Bus A wit Bridge for C87417 Si	emory controlle h slot 1 and du PCI 2.2 Bus C	er and I/ al ether	O Bridge) / net and PC	I-X Bus E	3 with DE, USB,
Ethernet controllers  CD-ROM / diskette Rear ports Front ports / graphics Console interconnects	on planar 24X-10X' <i>Rear:</i> or <i>Front:</i> tw sC2T Inte	r / PCI-X 64 CD-ROM ne USB (Ver ro USB (Ver rconnect™	4-bit 100 / IDE; <i>L</i> ers 1.1), ers 1.1); <sup>1</sup> cable (*	MHz Bus Diskette: C2T in, C Graphic 10 inch, 2	s A / full du 3.5" 1.44N 22T out, s s: SVGA / 245mm) is		n LAN® / AÌ ve / dust co vo ethernet / on plana vboard Vid	ert Standard F over t (RJ-45), one F r / 8MB SDRAN eo Mouse (KVI	ormat 1. RS-485 ( M std/ma M) chair	.0 / two rear (sys mgmt) , ax / 32-bit 33 ning cable) ,	RJ-45 po / no paral 3MHz PC / one Cab	lel port 1 2.2 bus
Systems mgmt  Diagnostics	monitorin with 20-p <b>Light Pa</b>	ng such as oin conn or th Diagno	temp, m planar stics™ (	nemory, c for contin (LED ligh	ptional di nuous pwr ts indicate	ssor (ISMP) / I sks, fans, powe (no ext pwr req e failing C-Doctor in BIO	er supply /  ) Xeon  Xeon		otional F B L2 Ca B L2 Ca	iemote Sup ache Proc ache Proc	ervisor A Upg Upg	
Security Software	unattend ServerG	n password ed boot / s <b>uide</b> ™ (CE IBM Direc	electabl D-ROM i	e boot / u nstallatio	nattended	d start mode	512M 1GB I 2GB I 80GB	B PC2100 CL2 PC2100 CL2.5 PC2100 CL2.5 ATA-100 EID GB 15K Ultra320	2.5 ECC ECC D ECC D E HDD	DDR-SDR DR-SDRAN DR-SDRAN *	AM ĎIMN 1 RDIMM 1 RDIMM	33L5039
Cooling fans Power supply Prerequisites	variable 332 watt Monitor, one Cabl	keyboard,	ot redun al / auto mouse, echnolog	idant or lo- sensing rack, dis gy (C2T)	hot-swap / auto-re k (some), Kit per ch	pply) / estart support operating sys, ain of servers	73.4G Remo xSerie break or NetB	B 19K Olliaszo B 10K-4 Ultra1 ote Supervisor es Cable Chai out cable and2 AY ACT Local ( not supported	60 SCS Adapter n Techr 2 meter I Console	I Hot-Swap s nology Cab KVM chainii Manager	SLHDD* le Kit (2	06P5756 09N7585 meter



Slot 1: halfsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus A Slot 2: fullsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus B

Bay ① 3.5", UltraSlim 0.5", access, std diskette
Bay ② 5.25", UltraSlim 0.5", access, std CD-ROM
Bay ③ 3.5", SL 1", access, std fixed or hot-swap disk
Bay ④ 3.5", SL 1", access, open for fixed or hot-swap access, open for fixed or hot-swap disk

Stealth black color front bezel

Steatill Diack Color Horit Dezel
 Utility tray in front slides out from under middle bay (USB devices)
 H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm
 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
 Configuration/Setup Utility: F1 at startup
 Diagnostics (PC-Doctor™): F2 at startup
 System Partition Boot: ALT+F1 at startup
 Network Boot: E12 at startup

Network Boot: F12 at startup Operator Information Panel in front

LSI Logic Configuration Utility: CTRL+C at startup

Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)

Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity<sup>13</sup> (model dependent): 293.6GB with two 146.8GB SL SCSI disks or 240GB with two 120GB EIDE disks

3 year IOR 24x7, 2 hr avg response

(ServicePac part num 69P9508)

http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf

24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

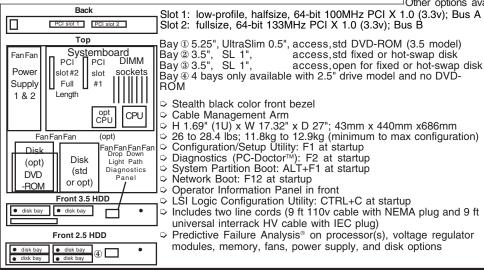
- = Hot-swap in some models
- S US models withdrawn effective March 2004
- △ 533Mhz FSB models may use 400Mhz FSB processors. 400Mhz FSB models may not use 533Mhz FSB processors.

# **LIMITED WARRANTY**<sup>3</sup>

- → 1 year parts and labor
   → International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time7
- On site service upgrade options (in
- eligible locations):<sup>7</sup>
   3 year IOR 9x5, NBD response
  (ServicePac® part num 69P9505)
- 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9506)
- 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9507)
- Other ServicePac options at

(X335B) © IBM Corp. April 2003

IBM® Type-GAV-model	Qty x Pro	cessor	L2 cache	Memory	Memory type	Disk		Disk controller	Power Supply	Disk bays	Slots x bav			Available date
8837-01y-01x	1 x Xeon <sup>®</sup>	<sup>®</sup> 2.8GHz	: 1MB	512MB	std	None (oper	3.5)	Ultra320	585W	2 hot-swap	2x3	2 x Gigabi	t 3 year	Oct 2004
	1 x Xeon			512MB	std	None (oper				2 simple-sp				
	1 x Xeon 1 x Xeon			1GB 1GB	std std	None (oper None (oper				2 hot-swap 2 hot-swap				
8837-2Ay-2Ax				1GB	std	None (open			585W	4 hot-swap	2x4	2 x Gigabi	t 3 year	Oct 2004
	1 x Xeon			1GB	std	None (open			585W	2 simple-sp	2x3	2 x Gigabi	t 3 year	Oct 2004
	1 x Xeon 1 x Xeon			1GB 1GB	std std	None (open None (open	3.5)	Ultra320		2 hot-swap 2 hot-swap				
8837-4Ay-4Ax				1GB	std	None (open				4 hot-swap				
	1 x Xeon	3.6GHz	1MB	1GB	std	None (oper	3.5)	SATA	585W	2 simple-sp	2x3	2 x Gigabi	t 3 year	Oct 2004
Positioning Processor(s) Cache SMP support Implementation	1 x 1ME 2-wa Syst	Intel® Xeo 3 L2 cach ay SMP / emboard	on 2.8, ne on a up to t contair	3.0, 3.2, 3 Il models / two Xeon ns two Inte	3.4, 3.6GHz on die of p Processors I 604 pin m	way server the with 800MH. brocessor / at a (same speed controlled ZIF) dual GB ether	z / <b>1M</b> proces d/cach socke	<b>B</b> L2 Cacl ssor speed e size) ets, eight [	ne / <b>Exte</b> I / ECC	ended Memo	ry 64	Technolog	y (EM64	T)
Memory	DIM char <b>Chi</b> r	M gold-co nnel / <b>Act</b> okill™; co	onnecto ive Me rrects 1	r slots on • <b>mory</b> ™): (	systemboa online spar 4-bit errors	s (6 avail) / Pord / DIMMs me and memor on same chip	nust be y mirro	e installed or / <b>Error</b> (	in match <b>Checkin</b>	ed pairs [a b <b>g and Corre</b>	ank] / cting	2-way mem (ECC) via	ory interlo 1 <b>6-bit Ch</b>	eave / dual ecksum
SCSI disk controlle						ntroller (LVD						mirroring	(Embedd	ed
SATA disk Contro	ller Enh	anced SA	TA-150	) (150MB/	sec) contro	ller / two con								
IDE controller / cal	ble one			ole to DVD		CCIO Esfacis	0 5 7		CATA	-000D with t	uo OF			
Disk - MAX capac Disk - bays						<i>CSI</i> 2.5:four / 80-pin SC <i>I</i>					WU 25	UGB NDD		
Mechanical Architecture / chip	osets Intel 32bi to H	l <b>E7520</b> / t/33MHz l ost Bridge	Intel M PCI) / Intel e for gra	emory Countel PCI-X	ntroller Hub Bridge (su ntroller, EID	upported in 2 (MCH) / 3 P pports 133MH E, USB, SME	CI bus Iz PCI	es (one 64 -X slots 1	4bit/133N & 2, LSI	/IHz PCI-X1.0 Logic 53C10	), one 20) / I	64bit/100M CH5R Sout	Hz PCI-X h Bridge	(Thin IMB
Bus slots Ethernet controller	(See	below) to gigabit 10	wo ava 0/100/1	ilable PCI- 000 ether	X 1.0 / no net ports / E	hot-swap Acti Broadcom BC	M5721	/ two full	gigabit e	thernet MAC	and F	PHY layer fu	nctions /	
DVD-ROM / diske					iz / full dup <i>ette:</i> none	lex / Wake or	ı LAN	/ Alert Sta	andard F	ormat 2.0 / ti	vo rea	r HJ-45 por	ts	
Rear ports						o, two ethern	et (RJ	-45), one I	RJ-45 (sv	/s mgmt) / m	ouse	ps2 / keybo	ard ps2	
Graphics						DRAM std/ma						. ,		
Systems mgmt	as te	emp, men	nory, op	otional disk	ks, fans, po	er (BMC) / H8 wer supply /								
Diagnostics	Dro	p down l	ight pa			req) out Front par	iel	Xeo	n 3.6GH:	z/1MB L2 Pr z/1MB L2 Pr	oc Up	g		13N0663 13N0665
Security	Pow	er-on pas	ssword	/ administ	rator passv	vord / nded start mo	de	1GB	(2x512)	66) PC3200 (L PC3200 CL	3 ECC	DDR2 Chi	pKill	73P3523 73P2865
Software	Serv	erGuide	™ (CD-		allation and	d configuration		80G 1600	B SATA GB SATA	) PC3200 Cl 7.2K Simple \ 7.2K Simple	Swap Swa	HDD p HDD		73P2866 73P8002 73P8003
Cooling fans	seve	en-nine fa	ns / vai	riable spec	ed / hot-swa	ap / redundar	ıt			Ultra320 SC				90P1304 32P0796
Power supply	585	watt hot-s				al / auto sensi				Ultra320 SC i+ adaptor	OI 1101	-3wap 2.5"	חטט	32P0796 13N2190
Droroguisitos		re-start	oord :-	201106 46-	de diele /c-	mal anarati-	a 0.72	Rem	note Sup	ervisor Adap		limline		73P9341
Prerequisites	IVION	iiior, keyb	oaru, n	nouse, rac	r, uisk (so	me), operatin	y sys			V Power sup		oord		90P5280
										x8 full-lengtl s available a			nc/us/acc	22R9293 essories
В	ack		lot 1 · I	ow profile	halfeizo	64-hit 100M	U- DC						p 3, 40, 400	23001100



- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):7
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
  - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
  - 5 year IOR 9x5, NBD response
  - (ServicePac part num 69P9246)
    Other ServicePac options at http://www.ibm.com/
  - services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM®		L2	FSB		Memory		Disk	Hot -swap or	Slots		Limited	Available
Type-model Qty x Pr	ocessor	cache	MHz	Memory	type	Disk		fixed disk bays		Ethernet	warranty <sup>3</sup>	date
8676-1AX 1 x Xeon	2.8B GHz	512KB	533	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigab	it 3 year I	Mar 2003
	er models nt to supp					tructures req	uiring net	work				
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel® 512KB / o 2-way SM Systembo	Xeon 2.0 n die of po P / up to tard conta	8BGHz <sup>1</sup> rocessor wo Xeor ins two I	with 533 / at process ntel 603-	BMHz fron essor spe sors (same pin micro-	itside bus / Hy ed (no L3 cach e speed/cache	/per-Threa ne) size) ets, four me	nance computin ding technolog emory DIMM sl	ay '			
Memory	PC2100 2 must be in	66MHz re stalled in ecking an	gistered matched d Corre	184-pin d pairs [a cting (EC	ECC DDF bank] / 2- CC) via 16	way memory ir -bit Checksur	Ms / four D nterleave /	IMM gold-conr dual channel / ™ (corrects 1, 2	memory	bus runs a	t 2 x 100M	Hz/
SCSI disk controller  IDE controller / cable	64-bit 100 one 16-bit	MHz PCI internal o	-X Bus E channel	3 / suppo / 16-bit 6	rts <b>RAID-</b> 8-pin LV[	<b>1 mirroring</b> (ED) cable from sy	mbedded /stemboar	controller (LV Mirroring) with d to backplane	two SC for two	SI disks in disks / no e	front bays external co	nnector
Disk - capacity Disk - bays	EIDE mod	<i>lels:</i> One <i>lels:</i> none	2-drop E standaı	EIDE cab	le to two o	disk bays / one 15000 rpm dis	: 1-drop El ks; <i>EIDE r</i>	DE cable to Cl nodels: 40GB neach disk bay	D-ROM / 7200 rp	om / ATA-1	` 00 / 8.7ms	seek
Mechanical Architecture / chipsets Bus slots	one CIOB slot 2 and SMBus, L	orks® Gra -X2 I/O B Ultra320 PC bus to	ind Cha ridge (IM / CSB5 Super I	<b>mpion</b> ™ /IB2 bus t South Bi /O) / Nati	<b>4.0 LE</b> / 0 to Host Br ridge (Thir ional Sem	CMIC LE Host ridge for PCI-X	Bridge (me Bus A wit Bridge for C87417 St	h sloṫ 1 and du PCl 2.2 Bus C	er and I/0 al ether	O Bridge) / net and PC	I-X Bus B	
Ethernet controllers CD-ROM / diskette Rear ports Front ports / graphics Console interconnects	on planar 24X-10X <sup>6</sup> <i>Rear:</i> one <i>Front:</i> two sC2T Interd	/ PCI-X 64 CD-ROM e USB (Ve o USB (Ve connect™	4-bit 100 / IDE; <i>[</i> ers 1.1), ers 1.1); <sup>1</sup> cable (1	MHz Bus Diskette: 3 C2T in, C Graphics 10 inch, 2	s A / full du 3.5" 1.44M 22T out, s s: SVGA / 45mm) is	iplex / Wake or IB diskette driverial (9-pin), tw ATI® Rage XL standard (Key	n LAN® / AÌ /e / dust co /o ethernet / on plana /board Vid	(RJ-45), one F r / 8MB SDRAM	ormat 1. RS-485 ( M std/ma M) chair	0 / two rear sys mgmt) ix / 32-bit 3 ing cable) /	RJ-45 por / no paralle 3MHz PCI / one Cable	ts el port 2.2 bus

IBM Integrated system management processor (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter

with 20-pin conn on planar for continuous pwr (no ext pwr req) Diagnostics Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode Software ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others Cooling fans Eight fans (five for system, three on power supply) / variable speed / not redundant or hot-swap Power supply 332 watt (-48 to -60 V dc [direct current]) / auto-sensing supports dual input sources (two power sources) / not redundant / not hot-swap / auto-restart support Monitor, keyb., mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5 Prerequisites

Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) OPTIONS Xeon 2.8BGHz/512KB L2 Cache Proc Upg 512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM 331 5038 1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5039 2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5040 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD 06P5776 Remote Supervisor Adapter ServeRAID™-4Mx Ultra160 SCSI Adapter 09N7585 06P5736 Cable Chain Technology (C2T) Cable Kit (2 meter 06P4792 breakout cable and 2 meter KVM chaining cable) NetBAY ACT Local Console Manager 1735L04

#### Back PCI slot 2 PCI slot 1 Top Systemboard PCI PCI Light Path slot slot Diagnostics #2 #1 DIMM Powe sockets Supply opt CPU CPU Fan Fan Fa an Fan Fan Fa Disk Disk CD-ROM (opt) (std or opt) Diskette Front

Slot 1: halfsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus A Slot 2: fullsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus B

Bay @3.5", UltraSlim 0.5", access, std diskette Bay @5.25", UltraSlim 0.5", access, std CD-ROM

Bay ③ 3.5", SL 1", Bay ④ 3.5", SL 1", access, std fixed or hot-swap disk access, open for fixed or hot-swap disk

- Stealth black color front bezel
- Utility tray in front slides out from under middle bay (USB devices)
- H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm
- 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity<sup>13</sup> (model dependent): 293.6GB with two 146.8GB SL SCSI disks or 240GB with two 120GB EIDE disks

## **LIMITED WARRANTY**<sup>3</sup>

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays. next business day response time7
- On site service upgrade options (in eligible locations):7
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
- 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
- 3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
- 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
- 5 year IOR 9x5, NBD response (ServicePac part num 69P9246)
  Other ServicePac options at
- http://www.ibm.com/
- services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

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See footnotes for important warranty information

Systems mgmt

US models announced February18, 2003

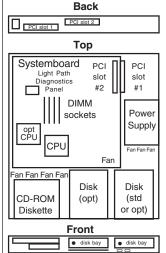
<sup>=</sup> Hot-swap

# IBM @server™ xSeries™ 335 (DC power model) (January 2004) xREF by eServer Field Skills Enablement Team

IBM <sup>⊚</sup> Type-model	Qty x Processor	L2 cache	FSB MHz		mory ype	Disk	Disk controller	Hot -swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty <sup>3</sup>	Available date
8676-LAX 1	x Xeon 2.8B GHz	512KB	533	512MB Chi	ipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigab	it 3 year	Jan 2004

DC power models are designed for network infrastructures requiring network equipment to support DC power environments

A highly manageable, ultra-dense 1U, 2-way server that delivers 1 x Intel® Xeon 2.8BGHz¹ with 533MHz frontside bus / Hype 512KB / on die of processor / at processor speed (no L3 cache) 2-way SMP / up to two Xeon Processors (same speed/cache siz Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, riser for one PCI-X slot, and integrated SCSI, ethernet, graphics	r-Threading technology re)											
<b>512MB</b> std / 8GB max <sup>13</sup> / two slots used / two slots available / <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs must be installed in matched pairs [a bank] / 2-way memory inter <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum C</b> detects 2- through 8-bit errors contained in two chips). Chipkill	/ four DIMM gold-connector slots on systemboard / DIMMs rleave / dual channel / memory bus runs at 2 x 100MHz / Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and											
All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embone 16-bit internal channel / 16-bit 68-pin LVD cable from syste All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / treation EIDE models: One 2-drop EIDE cable to two disk bays / one 1-6 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler page 15 SCSI m	pedded Mirroring) with two SCSI disks in front bays / emboard to backplane for two disks / no external connector wo connectors on planar / one 1-drop IDE cable (CD-ROM) drop EIDE cable to CD-ROM EIDE models: 40GB / 7200 rpm / ATA-100 / 8.7ms seek											
EIA 19" Rack (1U4) / rack-mount only / supported in 26" deep res ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Brid one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge for PCI-X Buslot 2 and Ultra320 / CSB5 South Bridge (Thin IMB to Host Brid SMBus, LPC bus to Super I/O) / National Semiconductor® PC8 (See below) two available PCI-X 1.0 / no hot-swap Active™ PCI	dge (memory controller and I/O Bridge) / us A with slot 1 and dual ethernet and PCI-X Bus B with dge for PCI 2.2 Bus C with graphics controller, EIDE, USB, 7417 Super I/O chip											
(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots  trollers  Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus A / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports iskette  24X-10X <sup>6</sup> CD-ROM / IDE; Diskette: 3.5" 1.44MB diskette drive / dust cover Rear: one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port graphics: Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus reconnects C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)												
IBM Integrated system management processor (ISMP) / H8 monitoring such as temp, memory, optional disks, fans, powers with 20-pin conn on planar for continuous pwr (no ext pwr req) Light Path Diagnostics™ (LED lights indicate failing compo	supply / support for optional Remote Supervisor Adapter											
Power-on password / administrator password /	OPTIONS											
unattended boot / selectable boot / unattended start mode ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others	Xeon 2.8BGHz/512KB L2 Cache Proc Upg 73P6382 2x256MB PC2100 CL2.5 non-Chipkill DIMM 73P2868 512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5038											
Eight fans (five for system, three on power supply) /	1 1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5039 2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5040											
332 watt (-48 to -60 V dc [direct current]) / auto-sensing / supports dual input sources (two power sources) /	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD 06P5776 Remote Supervisor Adapter 09N7585 ServeRAID <sup>TM</sup> -4Mx Ultra160 SCSI Adapter 06P5736											
not redundant / not hot-swap / auto-restart support   Cable Chain Technology (C2T) Cable Kit (2 meter												
5	1 x Intel® Xeon 2.8BGHz¹ with 533MHz frontside bus / Hype 512KB / on die of processor / at processor speed (no L3 cache) 2-way SMP / up to two Xeon Processors (same speed/cache siz Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, riser for one PCI-X slot, and integrated SCSI, ethernet, graphics 512MB std / 8GB max¹³ / two slots used / two slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMS must be installed in matched pairs [a bank] / 2-way memory intel Error Checking and Correcting (ECC) via 16-bit Checksum C detects 2- through 8-bit errors contained in two chips). Chipkil All (not used on EIDE models): LSI Logic® 53C1020 / Ultra32C d4-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Emtone 16-bit internal channel / 16-bit 68-pin LVD cable from syste All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / t EIDE models: One 2-drop EIDE cable to two disk bays / one 15CSI models: none standard / supports up to 15000 rpm disks; SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler p EIA 19" Rack (1U⁴) / rack-mount only / supported in 26" deep reserveWorks® Grand Champion™ 4.0 LE / CMIC LE Host Brid one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge for PCI-X Bustot 2 and Ultra320 / CSB5 South Bridge (Thin IMB to Host Bris SMBus, LPC bus to Super I/O) / National Semiconductor® PC8 (See below) two available PCI-X 1.0 / no hot-swap Active™ PC  Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5703 / on planar / PCI-X 64-bit 100MHz Bus A / full duplex / Wake on L 24X-10X° CD-ROM / IDE; Diskette: 3.5" 1.44MB diskette drive / Rear: one USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL/O CZT Interconnect™ cable (10 inch, 245mm) is standard (Keybo Technology Cable Kit required at end of chain (a cable with sep IBM Integrated system management processor (ISMP) / H8 monitoring such as temp, memory, optional disks, fans, power swith 20-pin conn on planar for continuous pwr (no ext pwr reg) Light Path Diagnostics™ (LED lights indicate failing compotential path of the path of the pat											



Slot 1: halfsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus A Slot 2: fullsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus B

Bay ① 3.5", UltraSlim 0.5", access, std diskette
Bay ② 5.25", UltraSlim 0.5", access, std CD-ROM
Bay ③ 3.5", SL 1", access, std fixed or he
access, open for fixed

access, std fixed or hot-swap disk

access, open for fixed or hot-swap disk

Stealth black color front bezel

- Utility tray in front slides out from under middle bay (USB devices)
- → H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm
   → 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)

- Configuration/Setup Utility: F1 at startup Diagnostics (PC-Doctor™): F2 at startup System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- □ Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity<sup>13</sup> (model dependent): 293.6GB with two 146.8GB SL SCSI disks or 240GB with two 120GB EIDE disks

## LIMITED WARRANTY<sup>3</sup>

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays, next business day response time7
- On site service upgrade options (in eligible locations):7
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
- 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
- 3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
- 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
- 5 year IOR 9x5, NBD response (ServicePac part num 69P9246)
  Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

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See footnotes for important warranty information

IBM®	v Drassass	L2	Ultra160	SCSI			Fixed		Power	Commiss	Available			
Type-model Qty: 8827-14X 2 x Pentiu	x Processor m® III 1.26GHz	cache Memory 512KB 2GB 1	x 36.4GB <sup>2</sup> 10K	controller 2 x Ultra160	anical 2U <sup>4</sup> rack		disk bays 2 fixed			Complian r NEBS-3	date Apr 2002			
		signed for networ power environm		s requiring net	work									
Positioning Processor(s) L2 cache Implementation SMP support	2 x Intel® Penti 512KB std and Motherboard co	ment Building Sys ium® III 1.26GHz- d max / ECC / at p ontains two Intel I a second identica	-S with 133MHz rocessor speed PGA370 sockets	<b>r frontside bus</b> / processor an s, six DIMM soo	s d L2 cach	ne in Fl	ip Chip F	in Grid	Array (FC	-PGA2)	ystems			
Memory	Error Checkin	B <sup>13</sup> max / 6 socket ng and Correctin MHz / six 168-pin	g (ECC) memor	y controller / ma	atched pa	airs req	uired / tw oorts reg	o-way i	nterleavin SDRAM E	g / :CC DIMM	ls only			
SCSI disk controller SCSI channels SCSI disk SCSI disk bays IDE controller / cable	SCSI Channel SCSI Channel 1 x 36GB Ultra Two fixed disk	A-7899W / dual cl A: external 16-bit B: one internal 10 160 SCSI, 10K rp bays (not hot-swa controller in South	t .8mm VHDCI 6 6-bit 68-pin LVD om, 4.9ms read s ap) in disk drive	8-pin external cable from co seek, S.M.A.R. carrier that slid	connecto ntroller to T. <sup>5</sup> les out fro	r`(no ca two-ba om fron	ables) ay disk dr t	ive carr	rier	4-bit PCI				
Mechanical Rack support PCI bus slots Chipset	EIA 19" Rack ( Designed for in (See below) the PCI 2.2 / peer I ServerWorks® South Bridge) / CSB5 South Bridge Baseboard Mai	(2U <sup>4</sup> ) x 20-inch d nstallation in a two ree full height full PCI buses / no ho II HE-SL chipse / NB6555 Champi ridge for EIDE, US nagement Control	eep p-post, 19" rack length 64-bit 33l t-swap Active™ et / CNB20HE-S ion I/O Bridge (0 SB, LPC bus for 9 ler	unit only (not si MHz slots / thre PCI slots IL North Bridge CIOB20) for PC Super I/O Natio	upported ee low-pro for CIOB I Bus B (s onal Semi	in IBM ofile ha and P slots, S conduc	NetBAY If length ( CI A 32-t CCSI) and ctor PC8	™ Rack 64-bit 60 bit 33Ml d C (slo 741(dis	s) / ships v 6MHz PCI Hz (graphi ts) / kette, seri	slots/ cs, etherne	et,			
10/100 ethernet CD-ROM / diskette Rear ports	24X-10X <sup>6</sup> CD-F Two USB ports connector for fr Y-splitter cable	VGA / PCI bus / ATI® Rage XL (on planar) / 8MB SDRAM std/max / 1600x1280 at 16M colors at 85Hz / 15-pin D-shell ower-on password / admin password / unattended boot / selectable boot / boot without keyboard / diskette write protect												
Security	Power-on pass	sword / admin pas	sword / unatten	ded boot / sele	ctable bo	ot/boc	t without	keyboa	ard / diske	te write pr	otect			
Alarm panel Status LEDs Systems mgmt Diagnostics OS support Software ship group	four alarm pane Operator Infor Integrated serr processors, tel ED diagnostic Red Hat Linux Resource CD	External alarm panel in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault  Operator Information Panel (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)  Integrated service processor (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /  LED diagnostics and on-board diagnostics providing an LED map to a failing component  Red Hat Linux® 7.1  Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide), PC-Doctor™ diagnostics diskette, and IBM Director (on separate CD)												
Keyboard / mouse Power supply	350 watt (-48 t supports dual i	ck-based) two / accessible to -60 V dc [direction of the courses of the course of the	ct current])/ o power source	s)/	1GB S 36.4G IBM E IBM S	DRAM B 10K 54 (13. leek Ty	ECC DI Ultra160 8" viewa vo-Buttor	MM 133 SCSI S ble) FS n Mouse	T Monitor e (black)	MM (black)	33L3324 33L3326 06P5751 633147N 28L3673			
Fans Prerequisites	fan failure signa fan in each pov Appropriate do	Itispeed / not hot-s als front panel ala wer supply / fan o power source ar oard, mouse, rack	.rm LED / n each Pentium nd customer sup	III processor					/board (bla /us/access		28L3644			
Slot 2: fullsize, 64 Slot 3: fullsize, 64 Slot 4: low-profile, 64 Slot 5: low-profile, 64 Slot 6: low-profile, 64  CDROM diskette disk bay  Bay ① 3.5", 0.5", Bay ② 3.5", 0.5", Bay ③ 3.5", SL 1".	lot 2: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B lot 3: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B lot 4: low-profile, 64-bit 66MHz PCI 2.2 (5v), Bus C lot 5: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C lot 6: low-profile, 64									ervice <sup>3</sup> I - Fri ays, see time excluding e time mber) see time sher) or warranty				

IBM® Type-model Qty x P		L2 ache Memory	Ultra320 SCSI disk	SCSI controller	Mech- anical	Slots x bays			Power supply	Compliant	Available date
8847-14X 2 x Pentium <sup>®</sup> 8847-24X 2 x Pentium								Yes D	C powe	er NEBS-3 er NEBS-3	Jul 2004
	odels are designe										
Processor(s) 2 L2 cache 51 Implementation Mo	etwork Equipment x Intel® Pentium® I2KB std and max otherboard containubsystems 2-way	Xeon 2.4GHz / ECC / at proce ns two Intel So	with 533MHz essor speed / procket 604 INT3/	frontside bocessor and l FCPGA, six	<b>us</b> L2 cache i DIMM soc	n Flip C	Chip Pin	Grid A	rray (FC	-PGA2)	egrated
sh	p to 2GB std / 12 nips with two 512 atched pairs requi	GB or 1GB DIN	/IMs / Error Ch	ecking and	Correctin	g (EC	C) mem	nory co			ailable /
SCSI disk 1:	CSI Channel A: e CSI Channel B: o x 73.4GB or 146. wo fixed disk bays	external 16-bit .6 one internal 16-l .8GB Ultra320 5 o (not hot-swap	8mm VHDCI 68 bit 68-pin LVD o SCSI, 10K rpm, ) in disk drive o	d-pin external cable from co 4.9ms read carrier that sli	connecto entroller to seek, S.M des out fr	or (no controller two-based) M.A.R.T Tom from	ables) ay disk .5 nt	drive c	arrier		CI
Mechanical Rack support PCI bus slots Chipset In Sc Ba	lA 19" Rack (2U <sup>4</sup> ) esigned for installa- see below) three fu Cl 2.2 / peer PCI ttel® E7501 chips- ch3-S South Bridge aseboard Manage see diagram below	x 20-inch dee ation in a two-poull height full ler buses / no hot- et / E7501 MCI 4Hz PCI Bus B ge for EIDE, US ment Controlle	pp pst, 19" rack uningth 64-bit 133N swap Active™ F H North Bridge (slots, SCSI) a B, LPC bus for	t only (not su MHz slots / th PCI slots for CIOB and nd C (slots) / Super I/O Na	pported ir ree low-p d PCI A 6 ational Se	n IBM N rofile ha 4-bit 33 micond	letBAY alf leng BMHz (	™ Rack th 64-bi	s) / ship it 66MH s, ether	es with rack z PCI slots net,	/
CD-ROM / diskette 24 Rear ports Tv co Y-	2 x Intel 82546 / on planar / full duplex / supports Wake on LAN®, PXE 2.0 Boot Agent, Adapter Fault Tolerance Failover 24X-10X® CD-ROM / multisession / IDE interface / bootable Two USB ports (Version 1.1); RJ-45 serial; PS/2 keyboard; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port / mouse connects to USB port (or keyboard port with standard Y-splitter cable) SVGA / PCI bus / ATI® Rage XL (on planar) / 8MB SDRAM std/max / 1600x1280 at 16M colors at 85Hz / 15-pin D-shell										
Security Po	Power-on password / admin password / unattended boot / selectable boot / boot without keyboard										
Status LEDs Systems mgmt Diagnostics OS support Software ship group	External alarm panel in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages/ four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault Operator Information Panel (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power) Integrated service processor (Baseboard Management Controller) / on planar/failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs/ LED diagnostics and on-board diagnostics providing an LED map to a failing component Microsoft Windows 2000, Windows 2003 Advanced Server / Red Hat AS 2.1 / SLES Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide)										
Power supply St 48 su	None (since rack-based) Std: one (14X) or two (24X); max: two / accessible from rear 480 watt (-48 to -60 V dc [direct current]) / supports dual input sources (two power sources) / redundant / hot-swap / auto-restart support  2GB PC2100 DDR ECC RDIMM Memory Kit Other options available via special Bid  73P412								73P4126		
faı faı Ap	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each Pentium III processor Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system										
Slot 2: fullsize, 64-bit	t 133MHz PCI-X ( t 133MHz PCI-X ( 20 disk bay  cess, std CD-F access, std disk	v), Bus B v), Bus B 3.3v), Bus C 3.3v), Bus C 3.3v), Bus C J Rack	SCSISĕlect CTRL+A PC-Doctor Several ha H 3.45" x V H 87.6 mm 34 to 37 pc	on/Setup Utili 2 at startup t near startup M diagnostics rdcopy publi V 17.14" x D x W 435.3 n ounds (15.4 t	ty invoked by press s on disk cations 20.0" nm x D 50 o 16.8 kg)	sing ette 08 mm		3/3 yea Internation site coverage next bu 2 year upgrad- location • 9 hr holid 96P2 • 24 hi 4 ho 96P2 • 24 hi 2 ho 96P2 24x7 <sup>14</sup> t	r parts tional W , 8 am - ge exclu siness ( on site e option ns): coverac lays, 4 l 1122 r x 7 da ur avera 1123 r x 7 da ur avera 1124 oll-free	nr response y coverage age respon- y coverage age respon- support fo	vice <sup>3</sup> - Fri tys, set sime <sup>7</sup> tervice te excluding te time e, se time e, se time r warranty
		All models: Max int disk capacity: 293.6GB² with two 146.8GB SL disks					→ 24x7 <sup>14</sup> toll-free support for warranty issues during the warranty period <sup>3</sup>				

Sivi @ server	XSelles	340 (A	Augus	1 200	14)		XREF b	y eSe	rver Field Skills	and Educa	tion Team	
IBM® Type-GAV-model Q	ty x Processor	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)		Power supply	Ethernet	Available date	
8840-01y-01U 1 x 8840-11y-11U 1 x 8840-21y-21U 1 x 8840-31y-31U 1 x 8840-41y-41U 1 x	Xeon 3.0GHz Xeon 3.2GHz Xeon 3.4GHz	1MB 1MB 1MB 1MB 1MB	512MB 1GB 1GB 1GB 1GB	None	2 x Ultra320 2 x Ultra320 2 x Ultra320 2 x Ultra320 2 x Ultra320	2U <sup>4</sup> 2U 2U 2U 2U 2U	4x8 (6 hot-swap 4x8 (6 hot-swap 4x8 (6 hot-swap 4x8 (6 hot-swap 4x8 (6 hot-swap 4x8 (6 hot-swap	) 1 x ) 1 x ) 1 x ) 1 x	625W hot-swap 625W hot-swap 625W hot-swap 625W hot-swap 625W hot-swap	2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit	Aug 2004 Aug 2004 Aug 2004 Aug 2004 Aug 2004	
Positioning Processor	1 x Intel® Xed	on™ Proc	essor 2.8	ring hig 3, <b>3.0</b> , 3	h availability, 3.2, 3.4, 3.6G	<i>scaiad</i> <b>hz</b> wit	h <b>800MHz</b> frontsi	de bus	or application-serv s / Optimized for	ıng vveb en	vironments	
L2 cache SMP support Implementation	1MB L2 Cache 2-way SMP / I Systemboard of	e / on die up to two contains t	of proces Xeon Pro wo Intel F	ssor / a ocessor PGA604	t processor s rs (same spe I micro-PGA	peed ed/cac ZIF so	Simultaneous me the size) ckets, eight memo ntegrated SCSI, d	ory DI	MM slots, two lov		I-X	
Memory	pin ECC DDR2 pairs [a bank]	2-SDRAM / 2-way m I <b>Correct</b> i	DIMMs / nemory in ing (ECC	eight [ terleave ) / optic	DIMM gold-co e / dual chan onal <b>16-bit C</b> l	nnectonel / A	available / DIMM or slots on system ctive Memory™: um Chipkill™ cor	board Memo	/ DIMMs must be bry mirroring, hot-	e installed ir spare mem	n matched ory <b>/ Error</b>	
SCSI disk controlle SCSI channels  IDE controller/cable Disk - capacity Disk - bays	supports RAID 5, 00, 10, 1E0, Two 16-bit cha backplane for VHDCI connece Enhanced IDE None standard	50 (installannels (or six disks; ctor / sup ATA-100	with up to lled on res ne interna Channe pports op controlle s 7200-15	o one leserved all and cell A: 16 stional & ser in IC 5000 rp.	hot-spare dis internal conne one external) -bit 68-pin in ServeRAID a H5 South Bri m disks/one	k / opt ector) / SCS terface dapter dge / d backpl	ional IBM ServeR.  I Channel B: 16-b  to support external coone connector on ane	AID™- oit 68-  nal SC onnect plana	7k Adaptor for low pin LVD cable fro CSI devices via e tor(s) for external ir / one 1-drop ID	v-cost RAID om systemb xternal SCS devices E cable (CI	0, 1, 1E, oard to SI 0.8mm	
Mechanical Chipset	Six hot-swap / 80-pin SCA-2 connectors / filler panels installed in each disk bay / all disk bays Ultra320-enabled  EIA 19" Rack (2U4) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel E7520 / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Proccesor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O (See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots											
Ethernet controller  Optical / diskette Front & Rear ports  Graphics	Two gigabit 10 on planar / PC 8X-24X <sup>6</sup> DVD- Front: one US (RJ-45), two R	/100/1000 I-X 64-bit ROM / ID SB (Vers 2 J-45 (sys	O ethernet 100MHz E; <i>Diske</i> 2.0) <i>Rear</i> mgmt) /	t ports / / full du tte: 3.5 two US	Two Broadcuplex / Wake 1.44MB dislos (Vers 2.0) allel port	om® 5 on LAN kette d , keybo	721 / two full giga N® / Alert Standard rive / dust cover oard, mouse, seria RAM std/max / 32-	d Form al (9-p	nat 2.0 / two RJ-4 nin), graphics (DB	5 ports in re	ear	
Security	_						oot / selectable bo					
Systems mgmt	IBM Baseboa H8S2168 / on environmental fans, power su Adapter II slim continuous po	planar / p monitorin upp / sup iline with	provides s ng such a ports opti reseverve	system s temp onal R ed coni	and` , optional dis emote Super	ks, visor	Xeon 2.8GHz 8001 Xeon 3.0GHz 8001 Xeon 3.2GHz 8001 Xeon 3.4GHz 8001 Xeon 3.6GHz 8001 512MB (2x256) PC	ИНz/11 ИНz/11 ИНz/11 ИНz/11	MB L2 Proc Upg	Jon-Chok Kit	13N0681 13N0688 13N0683 13N0684 13N0685 73P3523	
Diagnostics	Drop down lig	ght path	diagnost	i <b>cs</b> par			1GB (2x512) PC32 2GB (2x1GB)PC32	200 CL	.3 ECC DDR2 Nor	-Chpk Kit	73P3522 73P2866	
Software	map to failing p ServerGuide™ utilities), IBM	△ (CĎ-RC	M install	ation a	nd configurat		IBM ServeRÁID-7I IBM Remote Supe	Adap	ter Adapter II Slim		71P8642 73P9341	
Keyboard / mouse Power supply	None standard Std/Max: one/to	wò 625 w	att hot-sw	ap / rea		uto	73.4GB 10K Ultra3 146.8GB 10K Ultra 625W (N. Amreica	320 S Hot-S	CSI Hot-Swap SL   Swap Power Suppl	HDD	90P1305 90P1306 26K5097	
											1735L04 1735R16	
Prerequisites	Monitor, keybo									WADD 44:	3.72	
Slot 1: low-profile, Slot 2: low-profile, Slot 3: full, 64-bit 1 Slot 4: full, 64-bit 1 *slots 3 & 4 riser	64-bit 100MHz 3 33MHz 3.3v PCI 33MHz 3.3v PCI	.3v PCI-X  -X, not ho  -X. not ho	inon hot, ot-swap, E ot-swap, E	Bus A <sup>©</sup> Bus B* <sup>©</sup> Bus B* <sup>©</sup> riser <sup>©</sup>	<ul> <li>Configuration</li> <li>Diagnostics</li> <li>System Part</li> <li>Network Bo</li> </ul>	n/Setu (PC-D tition B ot: F12	ıp Utility: F1 at star octor™): F2 at star oot: ALT+F1 at sta	tup tup rtup	<ul> <li>⇒ 3 year parts a</li> <li>⇒ International \u20f3</li> <li>⇒ On site, 8 am coverage exclusiness day</li> </ul>	Warranty Se - 5 pm, Mon uding holid response til	rvice <sup>3</sup> - Fri ays, next me <sup>7</sup>	
Opt disk     Opt disk	Opt disk     Opt disk	Drop Down lig path panel		2U Rack	SCSI bus a	ctivity	LED, system information LED,	.				

 Opt disk Opt disk Opt disk Opt disk

Bay ① 3.5", 0.5", Bay ② 5.25", 0.5" Bay ③ 3.5", SL 1" Bay ④ 3.5", SL 1" access, slim diskette access, slim DVD-ROM access, hot-swap, open for disk ŠL 1", access, hot-swap, open for disk Bay © 3.5", Bay © 3.5", Bay © 3.5", Bay ® 3.5", SL 1", SL 1", SL 1", SL 1", access, hot-swap, open for disk Bays 3 through 8 support six SL disks; or 1 DDS5 Tape drive (2 slots used, additional PCI SCSI adaptor req)

system-error LED Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator

of an imminent component failure

⇒ Rack: H 3.36" x W 17.5" x D 27.5"

(H 85.4mm x W 443.6mm x D 698mm) 

Stealth black color

All models: Max int disk capacity: 880.0GB2 with six 146.8GB SL disks locations):7

 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac® 21P2077)

4 hour average response time
(ServicePac 21P2078)
4 hr x 7 day coverage,

4 day coverage,

2 hour average response time (ServicePac 21P2093)

Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf

24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

via SCA-2 connectors

В	IVI @SEI VEI ···	X3eHes	300	(Julie 200	13)			XHEF D	eserver	riei	a Skills En	abiem	ent i	eam
	IBM®		L3			SCSI	Mechan-	Slots x	RXE	Н	ot-swap	Mgmt	Ava	ilable
		Processor	cache	Memory	Disks	controller	ical		Exp Ports			adapter	r	date
	8686-1RQ 1 x Xec 8686-1SQ 2 x Xec		IMB 1MB	1GB Chipkill <sup>T</sup> 1GB Chipkill	<sup>™</sup> None None	Ultra160 Ultra160					(not reduni redundant			
<b>&gt;&lt;</b>	8686-1TQ 2 x Xeo	n MP 2.0GHz	1MB	3GB Chipkill	2 x 36.4GB 10	KUltra160	3U rack	6x5	One	Two	redundant	PCI	Nov	2003
	8686-2RQ 2 x Xeo 8686-3RQ 2 x Xeo		1MB 2MB	2GB Chipkill 2GB Chipkill	None None	Ultra160 Ultra160					redundant redundant			2003 2003
	Processors			™ Processor		r 2.8GHz¹ v	with 400N	/IHz fron	tside bus	/ Hy	per-Threadi	ng tech	nolo	gy
	L2 cache L3 cache			ocessor / at pro of processor /		need								
	Processor upgrade	4-way SMP	/ up to fo	our Xeon Proce	ssors MP (sam	ne speed/ca	che size	)						
	Implementation			ns four Intel 603 , ethernet, grap		IA ZIF SOCK	ets, one r	nemory	board slot	, SIX	Active™ PC	I-X SIO	ïS,	
	Memory			GB max <sup>12,13</sup> / tw		I). four (2G	B models	s) or six	(3GB mo	dels)	512MB DII	MMs in	 ıstalle	ed /
	,	1.7-inch tall	/ one m	emory board s	tandard with 8	B DIMM gol	d-connec	tor slots	/ DIMMs	mus	st be installe	ed in m	natch	ed
		Error Chec	king an	taneous transf d Correcting	er from two Di <b>(ECC)</b> via <b>16-</b> l	bit Checks	sum Chi	OIVIHZ re <b>okill</b> ™ (d	egisterea corrects 1	184-  , 2, ;	3, or 4-bit e	PRAIN	on sa	invis /
				through 8-bit e				`			, 			
	SCSI disk controller			Wide Ultra160						IHz P	CI / integra	ted on p	plana	ar
	SCSI connectors SCSI cabling			d to SCSI backı LVD cable inclu						he th	ree-bay bac	kplane	<b>;</b>	
	IDE controller / cabli			68-pin connecto			cable to	get signa	als to three	e-bay	backplane			
	Disk - capacity	None standa	ard / sup	ports up to 15,0	000 rpm disks	Ü								
	Disk - bays			s / converged tr										
	Mechanical			s (3U4) x 28" de	· · · · · ·			`			-			
	Chipset			et / IBM Memory ost Bridge; one										
		PCI-X 1.0, or	ne PCI 2	.2) / PCĬ 2.2 Bu	s 0 supports S0	CSI, graphic	s, ethern	et, adapt	ter slot wit	h Rei	mote Super\	isor Ad	dapte	
	Slots (Active™ PCI-)			South Bridge ( I.0 slots <sup>10</sup> availa										
		hot replace,	, hot up	grade, hot exp	<b>ansion</b> /separ	ated by insi	ulative pla	astič divi	ders					
	RXE Expansion Port	·		t up to 12 addi		lots via an	optional	IBM KX	E-100 Re	mote	Expansio	n Enci	osure	е
	CD-ROM / diskette Ethernet			3.5" 1.44MB d		board / full o	duplex / 3	32-bit PC	I / Wake	on I A	AN®/ Alert o	n I AN <sup>T</sup>	гм 2	
	Graphics controller	SVGA / S3®	Savage	4 LT / on system	mboard / 8MB :	SDRAM sto	d/ṁax / up	to 1280	0x1024 at	64K	colors at 85	Hz		
	Ports			nsion Port (to c ard, mouse, an										
	Security	•	,. ,	istrator passwo					· ·					
	Systems manageme													
	Diagnostics			ower on/off sys tics™ / primary										
	Diagnostics			nostics (operate							Enclosure	OHEHRS		11RX
	Software			server running ROM installation		ation	512M	B PC160	00 ECĊ D	DR S	SDRAM RD		33L3	3283
				or, and others	Trana comigan	allon					RAM RDIMI RAM RDIMI			3285 3287
	Keyboard/mouse			ause rack-base		owen /	Xeon	MP 2.00	Hz/1MB	L3 C	ache Proc I	Jpg	73P8	8805
	Powersupplies	redundant w	ith two p	watt hot-swap; ower supplies (	some configura		Xeon	MP 2.50 MP 2.80	HZ/1MB	L3 C L3 C	ache Proc I ache Proc I	Jpg Jpa		8806 8807
		worldwide / v	oltage-s	sensing/auto-r	estart/	,	370 wa	att Hot-S	wap Redu	ındar	nt Power Sup	oply	31P6	6108
	Coolingfans	fans in each Six hot-swap		dant, multi-spe	ed fans /						60 SCSI Ad SI Hot-Swa			5736 5756
				each power su agnostic LED a		ecor	IBM N	etBAY42	2 Standard	Rac	k (SR)		9306 1519	6420
	0:	<u> </u>		agnostic LLD a	ina mgimi proce	,3301					er for iSerie: r Monitor (bl			2AB1
	Six available 3.3 vol  Bus 2 (B) with two			)					at ibm.cor	<b>n</b> /pc/	us/accessoi	ies		
	- one fullsize, 64	4-bit, 133MHz P(	CI-X, hot	-swap Spini	ensions: H5.25 ensions: H133.				m	LII	MITEDWA	RRAN'	<b>TY</b> <sup>3</sup>	
	- or two fullsize, 64 - or two fullsize, 64			-swap   ⇒ Wei	ght: 58.4 to 70lb			. 5 / 0 / 111			arts and lak			
	- or two fullsize, 64	4-bit, 66MHz P0	CI, hot-	-swap	alth black color I-free serviceab	ilitv			□ Inte	rnati	onal Warrar	ity Serv		
	- or two fullsize, 64	4-DIT, 33IVIHZ P	ان, not		ess adapters, p		memory,	and	⇒ Un s	site,	8 am - 5 pm	, won -	Fri	

- Bus 1 (A) with four slots supports (slots 3, 4, 5, 6):
   four fullsize, 64-bit, 66MHz PCI-X, hot-swap or two fullsize, 64-bit, 66MHz PCI, hot-swap
- or four fullsize, 64-bit, 33MHz PCI, hot-swap Bus 0 with one slot supports:
- only for standard Remote Supervisor Adapter halfsize, 64-bit, 33MHz PCI, not hot-swap

	Std	Std or opt	Opt	diskette CD-ROM
П		Power		• Disk ③
П	Supply	Supply	Supply	• Disk 4
	L•	•	•	<ul> <li>Opt disk</li> </ul>

3U Rack

Bay ① 3.5", 0.5", access, diskette Bay ② 3.5", 0.5", access, CD-ROM Bay ③ 3.5", SL 1", access, hot-swap Bay ④ 3.5", SL 1", access, hot-swap Bay ⑤ 3.5", SL 1", access, hot-swap

- Access adapters, processors, memory, and systemboard from top
- Access power supplies and disks from front
- Setup Program by pressing F1 at startup
  Diagnostics (PC-Doctor) by pressing F2 at startup
  SCSISelect by pressing Ctrl+A at startup
  Top cover Light Path Diagnostics (level 2
  diagnostic panel) for outside view of potential
- problem without removing cover
  Information LED panel, diagnostic LED panel, and component LEDs give visual indications of
- system well-being Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

All models: Maximum internal disk capacity: 220.2GB with three 73.4GB2 hot-swap SCSI disks

- coverage excluding holidays, next business day response time<sup>7</sup> On site service upgrade options
- (in eligible locations):7
- 3 year IOR 24x7, 4 hr avg response (ServicePac® part num 96P2253)
   3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2254)
- 4 year IOR 9x5, NBD response (ServicePac part num 96P2255)
- 5 year IOR 9x5, NBD response (ServicePac part num 96P2259)
- Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

В	M <b>@server</b> ™ x	Series™ 365					х	REF by	eServer	Field Skil	Is Enable	ment Team
	IBM®	L3		DIMM		SCSI	Mechan-	Slots x	RXE	Hot-swa	p Warra	nty Available
	Type-model Qty x Pro 8861-1RX 1 x Xeon™		Memory			controller Ultra320	ical			one (not r	ies (yrs	
	8862-1RX 1 x Xeon M 8862-2RX 2 x Xeon M 8862-3RX 2 x Xeon M	1P 2.0GHz 1MB 1P 2.5GHz 1MB	2GB Chipkill 2GB Chipkill 2GB Chipkill	8 8	None None	Ultra320 Ultra320 Ultra320	3U rack 3U rack	6x8 6x8	One One	One (not r Two redun Two redun	redun) 3 Idant 3	Dec 2003 Dec 2003 Dec 2003
	Processors L2 cache L3 cache	1 or 2 x Intel® Xec 512KB / on die of p 1MB or 2MB / on de	on™ Processor processor / at pr	MP 2.0, rocessor s	<b>2.5, o</b> i peed	r 2.8GHz¹						
	Processor upgrade Implementation	4-way SMP / up to Systemboard con- slots, and integral	four Xeon Proc tains four Intel	essors Mi 603-pin m	P (sam nicro-F	ne speed/c	ache size ockets, o	) ne memo	ory boar	d slot, six	Active™ P	CI/PCI-X
	Memory	Up to <b>2GB</b> std / 3 DIMMs installed / matched pairs / P ( <b>ECC</b> ) via <b>16-bit</b> and <b>Active Memo</b>	one memory be C2100 200MHz Checksum Ch	oard stand z registere i <b>pkill</b> ™ / \	dard w ed 184 With 1	vith 8 or 16 1-pin DDR 6 DIMMs	S DIMM g -SDRAM installed:	old-conne RDIMMs Memory	ector slo / <b>Error</b>	ots / DIMMs Checking	s must be and Cor	installed in recting
	SCSI disk controller	LSI Logic® 53C103 Supports Raid 0/1	30 / Wide Ultra32	20 SCSI (L	_VD 32	20MB/sec)	/ dual cha	annel / 64	-bit 100 <b>i</b>	MHz PCI-X	/ integrate	d on planar /
	SCSI connectors SCSI cabling IDE controller / cabling Disk - capacity Disk - bays	One internal and one standard 16-bit	t LVD cable can er 68-pin conne A-33 controller supports up to	be reattack ector on s in CSB6 15,000 rpr	hed to ystem South n disk	optional Se board for t Bridge ss	erveRAID a this cable	adapter fro	om six-ba	ay backplane	e instead o ackplane	f motherboard
	Mechanical	EIA 19" rack mo	dels (3U4) x 28	deep / s	uppor	ted in Net	BAY™ Ra	acks (sucl	h as Ne	tBAY42 SF	, NetBAY	42 ER)
	Chipset  Slots (Active™ PCI-X)	IBM XA-32™ chip Bridges provide si graphics), and Se / PCI-X Bus 1 sup Six total PCI-X slots	x peer PCI-X burverWorks® CSE ports gigabit Etl (one unavailable	usés / PCI 36 South I hernet, SC e) / 5 hot-sv	I-X Bu Bridge CSI, ar wap PC	s 0 support (IDE, USI nd slot for 6 CI-X 1.0 slo	rts adapte B, bus for optional S ts <sup>10</sup> availat	er slot with Super I/G ServeRAID DIE with po	h Remo O NS 8 D adapte ower and	te Supervis 7417 [diske er attention ind	sor Adapte tte, keybo dicator light	r II (inc. ard, mouse])
	RXE Expansion Port	sensors control pov One port to suppo	ver to slot) / hot r	eplace, ho	t upgra	ade, hot exp	oansion / s	eparated	by insula	ative plastic	dividersbv	
	CD-ROM / diskette Ethernet Graphics controller Ports	24X-10X <sup>6</sup> CD-ROI Broadcom <sup>®</sup> 5704 10 onboard graphics <i>Rear:</i> RXE-100 Ex two USB (Ver 1.1),	0/100/1000 dual disabled / uses cpansion Port (to	ethernet / c s video on o connect	on syst Remo option	ote Super nal RXE-10	visor Ada 00), RXE	pter II Managem	nent Por	t (to manaç	ge optiona	I RXE-100),
	Security	Power-on and adm	ninistrator passv	vords / una	attende	ed boot / se	electable b	ooot				
	Systems management Diagnostics	Remote Supervis console and mgmt Light Path Diagn IBM Real Time Dia	t / power on/off : nostics™ / prima	system / n ary indica	nonitor tor on	rs power st informatio	tatus, op :	system, te	emperat	ure, disks, 1	fans, powe	er supplies
	Software	available even whi <b>ServerGuide™</b> (C utilities), IBM Direct	D-ROM installat		nfigur	ation	1GB P	C2100 E	CC DDF	DR SDRAN R SDRAM F R SDRAM F	RDIMM	33L5038 73P2031 33L5040
	Keyboard / mouse Power supplies	None standard (be Std: one or two 99 redundant with two worldwide / voltage	50 watt hot-swa power supplies ge-sensing / au	ip; <i>Max:</i> to s (some co	nfigur	ations)/	IBM x3 Xeon N Xeon N Xeon N	365Memo MP 2.0GH MP 2.5GH MP 2.8GH	ry Upgr Iz/1MB Iz/1MB Iz/2MB	ade Card L3 Cache F L3 Cache F L3 Cache F ver Supply	Proc Upg Proc Upg Proc Upg	73P9710 73P7073 73P7074 73P7075 73P7214
	Cooling fans	fans in each powe Six hot-swap, redu one additional fan fan failure signals	ındant, multi-spe in each power s	upply / PF		essor	IBM Se IBM 73 IBM In IBM T5	erveRAID 3.4GB 15I tegrated : 541 15" F	™-4Mx K Ultra3 xSeries lat Pane	Ultra160 S 20 SCSI Ho Adapter for al Color Mo	ÒSI Ádapt ot-Swap r iSeries nitor (blacl	ter 06P5736 32P0735 1519100 k) 9512AB1
	Six available 3.3 volt P	CI/PCI-X slots:								nsion Enclo com/pc/us/a		86841RX s
	Standard Remote Su - one fullsize, 64-bit Optional ServeRAID	t, 33MHz PCI, hot- upervisor Adapter ir t,100MHz PCI-X,ho	otstalled ⇒ We otswap ⇒ Ste	nensions: I	H133.4 83lbs color	" x W17.4" 4mm x W4- ; 28.6 to 3'	L x D27.6" 42.0mm x	'	≈ 1 or	·	OWARRA rts and lab	NTY <sup>3</sup> por ervice <sup>3</sup>
	Optional iSeries IXA - three fullsize, 64-bit	adapter to install	' Acc	ess adapt temboard		ocessors, i	memory, a	and	CO	verage exc t business	luding hol	lidays,

0	CD-ROM	diskette
Opt disk	Opt disk	Opt disk
Opt disk	Opt disk	Opt disk
	3U Rack	

Bay ① 3.5", 0.5", Bay ② 5.25",0.5" Bay ③ 3.5", SL 1", Bay ④ 3.5", SL 1", Bay ⑤ 3.5", SL 1", Bay ⑥ 3.5", SL 1", Bay ⑦ 3.5", SL 1", Bay ⑥ 3.5", SL 1", access, std diskette access,std CD-ROM access, hot-swap, open 
- systemboard from top
- Access power supplies and disks from front Setup Program by pressing F1 at startup
- <u>Diagnostics</u> (PC-Doctor) by pressing F2 at startup SCSISelect by pressing Ctrl+A at startup Top cover Light Path Diagnostics (level 2
- diagnostic panel) for outside view of potential problem without removing cover Information LED panel, diagnostic LED panel,
- and component LEDs give visual indications of system well-being Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs,

and fans with IBM Director

All models: Maximum internal disk capacity: 878.4GB with six 146.8GB2 hot-swap SCSI disks

- next business day response time7 On site service upgrade options
- (in eligible locations):7 3 year IOR 24x7, 4 hr avg response ( 30L9186 (8861) / 96P2253 (8862) )
- 3 year IOR 24x7, 2 hr avg response 31L2722 (8861) / 96P2254 (8862) )
- 4 year IOR 9x5, NBD response ( 69P9210 (8661) / 96P2255 (8862)
- 5 year IOR 9x5, NBD response 69P9214 (8661) / 69P2259 (8862) )
- Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

DIVI @ SEI VEI ···· 2	xSeries 305 (Warch 2004)	XREF by eserver Field Skills Enablement Team
IBM®	L3 DIMM SCSI	Mechan- Slots x RXE Hot-swap Warranty Available
8861-4RX 1 x Xeon <sup>T</sup> 8861-1EX 2 x Xeon 8862-4RX 1 x Xeon 8862-5RX 2 x Xeon 8862-6RX 2 x Xeon	rocessor cache Memory slots Disks controller  MP 2.2GHz 2MB 1GB Chipkill™ 8 None Ultra320  MP 2.0GHz 1MB 4GB Chipkill 8 3x36.4-10k Ultra320  MP 2.2GHz 2MB 2GB Chipkill 8 None Ultra320  MP 2.7GHz 2MB 2GB Chipkill 8 None Ultra320  MP 3.0GHz 4MB 2GB Chipkill 8 None Ultra320  MP 2.7GHz 2MB 8GB Chipkill 8 None Ultra320  MP 2.7GHz 2MB 8GB Chipkill 8 None Ultra320	3U <sup>4</sup> rack 6x8 One One (not redun) 1 Mar 2004 3U rack 6x8 One One (not redun) 1 Nov 2004 3U rack 6x8 One One (not redun) 3 Mar 2004 0 3U rack 6x8 One Two redundant 3 Mar 2004 0 3U rack 6x8 One Two redundant 3 Mar 2004
Processors L2 cache L3 cache Processor upgrade Implementation	1,2 or 4 x Intel® Xeon™ Processor MP 2.0, 2.2, 2.7, or 3.0GHz 512KB / on die of processor / at processor speed 1MB, 2MB or 4MB / on die of processor / at processor speed 4-way SMP / up to four Xeon Processors MP (same speed/cac Systemboard contains four Intel 603-pin micro-PGA ZIF sockets integrated SCSI, ethernet, graphics	che size)
Memory	Up to <b>4GB</b> std / 32GB max <sup>12,13</sup> using high-capacity memory card / DIMMs must be installed in matched pairs / PC2100 200MHz re Correcting (ECC) via 16-bit Checksum Chipkill <sup>™</sup> / With 16 D and Active Memory <sup>™</sup> supporting Memory Mirroring <sup>™</sup> (non-O	
SCSI disk controller SCSI connectors SCSI cabling IDE controller / cabling Disk - capacity Disk - bays	LSI Logic® 53C1030 / Wide Ultra320 SCSI (LVD 320MB/sec) / dt. One internal and one external SCSI connector / internal controlle One standard 16-bit LVD cable can be reattached to optional Se SCSI RAID adapter 68-pin connector on systemboard for this cag Enhanced IDE ATA-33 controller in CSB6 South Bridge 1Ex: 3 x 36.4GB-10k 5Ex: 6 x 36.4GB-15K / supports up to 15,0 Six hot-swap bays / converged tray / 80-pin SCA-2 connectors	er wired to SCSI backplane erveRAID adapter from six-bay backplane instead of motherboard able to get signals to six-bay backplane
Mechanical	EIA 19" rack models (3U4) x 28" deep / supported in NetBAYTM	Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset  Slots (Active™ PCI-X)  RXE Expansion Port	IBM XA-32™ chipset / IBM Memory I/O Controller (improved per provide six peer PCI-X buses / PCI-X Bus 0 supports adapter sle ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O gigabit Ethernet, SCSI, and slot for optional ServeRAID adapter ) Six total PCI-X slots (one unavailable) / 5 hot-swap PCI-X 1.0 slot sensors control power to slot) / hot replace, hot upgrade, hot exp One port to support up to 12 additional PCI-X slots via an optional	ot with Remote Supervisor Adapter II (inc. graphics), and 0 NS 87417 [diskette, keyboard, mouse]) / PCI-X Bus 1 supports ts <sup>10</sup> available with power and attention indicator lights (optical bansion / separated by insulative plastic dividersby
CD-ROM / diskette Ethernet Graphics controller Ports	24X-10X <sup>6</sup> CD-ROM / 3.5" 1.44MB diskette drive Broadcom <sup>®</sup> 5704 10/100/1000 dual ethernet / on systemboard / onboard graphics disabled / uses video on Remote Supervisor A Rear: RXE-100 Expansion Port (to connect optional RXE-100), F (Ver 1.1), keyboard, mouse, analog DB-15 graphics, ethernet / or	Adapter II RXE Management Port (to manage optional RXE-100), two USB
Security	Power-on and administrator passwords / unattended boot / selection	ctable boot
Systems managemen Diagnostics	and mgmt / power on/off system / monitors power status, op system / monitors power status, op system / monitors power status, op system / path Diagnostics / primary indicator on information pan	stem, temperature, disks, fans, power supplies
Software	IBM Real Time Diagnostics (operated through IBM Director) available even while server running ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others	512MB PC2100 ECC DDR SDRAM RDIMM 73P2031 1GB PC2100 ECC DDR SDRAM RDIMM 73P2030 2GB PC2100 ECC DDR SDRAM RDIMM12 73P2030 IBM x365 Memory Upgrade Card 73P9710
Keyboard / mouse Power supplies	None standard (because rack-based) Std: one or two 950 watt hot-swap; Max: two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA	Xeon MP 2.2GHz/2MB L3 Cache Proc Upg Xeon MP 2.7GHz/2MB L3 Cache Proc Upg Xeon MP 3.0GHz/4MB L3 Cache Proc Upg 950 watt Hot-Swap Power Supply (WW) 13N0710 73P7214
Cooling fans	Six hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor	IBM ServeRAID™-6M Ultra320 SCSI Adapter 32P0033 IBM 73.4GB 15K Ultra320 SCSI Hot-Swap 32P0735 IBM Integrated xSeries Adapter for iSeries 1519100 IBM T541 15" Flat Panel Color Monitor (black) 9512AB1
Six available 3.3 volt		RXE-100 Remote Expansion Enclosure 86841RX Other options at ibm.com/pc/us/accessories
Standard Remote S - one fullsize, 64-b Optional ServeRAII - one fullsize, 64-b Optional iSeries IXA	bit, 33MHz PCI, hot-swap Supervisor Adapter installed bit, 100MHz PCI-X, hot-swap D adapter to install bit, 133MHz PCI-X, hot-swap bit, 133MHz PCI-X, hot-swap	442.0mm x D701mm 37.6kg  ⇒ 1 or 3 year parts and labor ⇒ International Warranty Service³ ⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time²

0 🗖	CD-ROM	diskette
Opt disk	Opt disk	Opt disk
Opt disk	Opt disk	Opt disk
	3U Rack	

Bay ① 3.5", 0.5", Bay ② 5.25", 0.5" Bay ③ 3.5", SL 1", Bay ④ 3.5", SL 1", Bay ⑤ 3.5", SL 1", Bay ⑥ 3.5", SL 1", Bay ⑦ 3.5", SL 1", Bay ⑥ 3.5", SL 1", access, std diskette access,std CD-ROM access, hot-swap, open 
- Access power supplies and disks from front
- Setup Program by pressing F1 at startup
- Diagnostics (PC-Doctor) by pressing F2 at startup
   SCSISelect by pressing Ctrl+A at startup
   Top cover Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
- Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
- Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

All models: Maximum internal disk capacity: 878.4GB with six 146.8GB2 hot-swap SCSI disks

- On site service upgrade options (in eligible locations):7
  - 3 year IOR 24x7, 4 hr avg response
     ( 30L9186 (8861) / 96P2253 (8862) )
     3 year IOR 24x7, 2 hr avg response
  - ( 31L2722 (8861) / 96P2254 (8862) ) • 4 year IOR 9x5, NBD response
- 69P9210 (8661) / 96P2255 (8862) )
- 5 year IOR 9x5, NBD response 69P9214 (8661) / 69P2259 (8862) ) Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

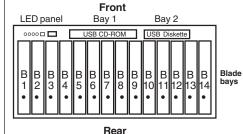
## IBM @server™ xSeries™ 445 (8-way Xeon MP) (March 2004) xREF by eServer Field Skills Enablement Team

IBM® Type-model Qty x	Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mech- anical		SMP/RXE Exp Ports	Hot-swap pwr supplies		Available date
8870-12X 2 x Xeon 8870-22X 2 x Xeon 8870-42X 4 x Xeon 8870-3EX 2 x Xeon 8870-4EX 4 x Xeon	MP 2.0GHz MP 2.2GHz MP 2.7GHz MP 3.0GHz DP 3.0GHz DP 3.0GHz	2MB 2MB 4MB N/A N/A	64MB 2 64MB 2 64MB 2 64MB 2	2GB Chipkill <sup>TI</sup> 2GB Chipkill 2GB Chipkill 2GB Chipkill 2GB Chipkill 2GB Chipkill	None None None None None	2xUltra32 2xUltra32 2xUltra32 2xUltra32 2xUltra32	0 4U rack	6x4 6x4 6x4 6x4 6x4	3/1 3/1 3/1 3/1 3/1	Two redundan Two redundan Two redundan Two redundan Two redundan Two redundan	t PCI t PCI t PCI t PCI t PCI	May 2004 Mar 2004 Mar 2004 Mar 2004 Mar 2004 Mar 2004
Positioning Processors L3 cache L4 cache Processor upgrade SMP Expansion Module Additional boards	Up to 8-way (12 or 4 Intel®) Up to 4MB e 64MB XceL4 64MB in each 4-way SMP (10 one SMP Exp for Xeon, 64MI Expansion Por I/O Board (P Board)	u (1 O1 /	C I IOOL DI	lage, cool, t		, grapinos,	Coulii Dii	ago, ou	1001 1/O, t	sion-critical busing / supports Hy r speed Module) / ability Controllels only) 603-pin microconnected via o Expansion Port op Modules, 1/4 p Modules, 1/4	luuptoi	,, 0110
Memory	16 DIMM gold / Error Check	-connect t <b>ing and</b> tt once; r	or slots / <b>Correcti</b> edundan	must install to ing (ECC) and t bit steering)	wo inder d <b>Chipk</b>	itical DIMM <b>ill</b> ™ via <b>Me</b>	ls at same mory Prot	time / 2 <b>eXion</b> ™	!-way inte	our 512MB DIM rleaving / PC21 or 4-bit errors hot-add (OS s	00 DDF on same	R SDRAM e chip; up
SCSI disk controller SCSI implementation IDE controller Disk - capacity/bays	First channel second chann one standard Enhanced IDE	to intern lel to one (longer) E ATA-1	al 2-port e externa 16-bit L' 00 contro	: SCSI backp ll .8mm VHD( VD cable incl oller in South	lane for CI 68-pir luded fo Bridge	internal hon connector attaching / one one-	ot-swap dis r (16-bit LV an option drop IDE d	ks (16-l /D cable al Serve able to	oit LVD ca e from I/C eRAID ac backplar	able to SCSI b DBoard to ext dapter to the to he for diskette	ackplan connect wo-bay and CE	ie) / tor) / backplane )-ROM
Mechanical	EIA 19" rack	models	(4U <sup>4</sup> ) x	28" deep / sı	upported	d in NetBA	Y™ Racks	(such a	as NetBA	Y42 SR, NetBA	AY42 EF	R)
Chipset  Slots (Active™ PCI-X)	Expansion Po	rts / IRM	Memory	I/O Controller	r with tw	o remote I/	O norts (ea	ich to a	IBM PCI	e controller and -X Host Bridge lot with Remote ard, mouse]) / ed to the PCI-X	) / each	IBM PCI-
Slots (Active <sup>™</sup> PCI-X) RXE Expansion Port	One RXE-100	Remote	Expansion	n Enclosure ca	an be sh	ared between	en two x44	5 4-way,	, 8-way, o		s 445 se	ervers or
CD-ROM / diskette Ethernet Graphics controller Ports	Dual Broadco	mª 5704 Rage XL 00 Expan	10/100/1 . / on I/O ision Por	000 ethernet Board / 8MB t (to connect	controlle SDRAM optional	r / on I/O B 1 std/max / RXE-100)	soard / full o up to 1280 , RXE Man	duplex / )x1024 iageme	64-bit 66 at 85Hz nt Port, tv	MHz PCI bus / vo USB (Vers	Wake o	on LAN <sup>®</sup>
Security	Power-on and	l adminis	strator pa	sswords / un	attended	d boot / sel	ectable bo	ot				
Systems mgmt Diagnostics Software	console and r	ngmt / p iagnosti ne Diagn n while s ™ (CD-R	ower on/ i <b>cs</b> ™ / pr ostics (o server ru ROM inst	off system / imary indicat perated throuning allation and o	monitors or on in ugh IBM	power sta formation p Director) ation	tus, op sys panel with xSeries SI 1GB DDR 2GB DDR	stem, te LEDs a MP Exp PC210 PC210	emperatur issociated ansion M 0 ECC S 0 ECC S	ial connectors e, disks, fans, d with failing c odule DRAM RDIMM DRAM RDIMM Cache Proc U	power s ompone 02 1 33 1 33	supplies
Keyboard / mouse Power supplies Cooling fans	None standar Std: two; max watts at 110v front access / fans in each p Four hot-swap one additiona fan failure sig	c: two / h / redund / worldwi cower su p, redun I fan in e	ot-swap dant at 2 ide / volt upply / Pl dant, mu each pow	/ 1050 watts 20v with two cage-sensing FA ulti-speed fan ver supply / P	power s / auto-re s / FA /	or 550 supplies / estart /	Xeon MP Xeon MP IBM 73.4G IBM Serve IBM Remo NetBAY11 8X/4X/24X IBM T540	2.7GHz 3.0GHz 3B 10K PRAID™ ote Sup Standa Max C 15" Fla	J/2MB L3 J/4MB L3 Ultra160 J-6M Ultra ervisor Ad ard Rack CD-RW U t Panel C	Cache Proc U Cache Proc U SCSI Hot-Swa 320 SCSI Ada dapter II-EXA	pg 1; pg 1; p 0; pter 3; 1; 9; olack) 9;	3N0722 3N0721 6P5756 2P0033 3N0382 306110 2P9101
Six available 3.3 volt Slot 1: fullsize, 64-bit Slot 2: fullsize, 64-bit Slot 3: fullsize, 64-bit Slot 4: fullsize, 64-bit Slot 5: fullsize, 64-bit Slot 6: fullsize, 64-bit Slot: used by Remo	66MHz PCI-X, 66MHz PCI-X, 100MHz PCI-X, 100MHz PCI-X, 133MHz PCI-X, 133MHz PCI-X, te Supervisor Access, diskett access, CD-RC access, hot-swaccess, hot-sw	hot-swaphot-sw	o Bus A p, Bus B p, Bus B p, Bus C p, Bus D 33MHz ack	Max weight Stealth blate Tool-free Stealth Blate Tool-	ns: H178 nt: H10 lb lck color lck co	mm x W48 s; 50kg bility s, memory, odule from plies and di pressing F- octor) by pr ssing Ctrl+/ anel and fro li (1st and 2 t removing of	adapters, a top sks from fro 1 at startup ressing F2 A at startup nt-accessite and level cover) lerts on proche, memoritisks with	and ont at startuble pull- cessors ry, fans,	int its war	LIMITED WA year parts and ernational Wai a site, 9 hr x 5 xt day respon year on site w grade option ( actions): 4 hr x 7 day co hour respons No ServicePac st warranty m rvices availat her ServicePa tp://www.ibm.c. //pdf/wamomxe x714 toll-free si irranty issues irranty periods ((X445C) © IBM	labor rranty S day co se time arranty in eligib overage, e time available aintenariole c optior com/ser eu.pdf upport f during	ervice <sup>3</sup> verage, 7 service ele , ) nce ns at vices/us/ or the

## IBM @server™ xSeries™ 445 (8-way MS Datacenter#) (3/04) xREF by eServer Field Skills Enablement Team

IBM <sup>®</sup> Type-model Qty x l	Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mech- anical		SMP/RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date		
8870-1BX 2 x Xeon 8870-2BX 2 x Xeon 8870-4BX 2 x Xeon	MP 2.7GHz	2MB 2MB 4MB	64MB (	OGB Chipkill™ OGB Chipkill OGB Chipkill	None	2xUltra320 2xUltra320 2xUltra320	0 4U rack	6x4	3/1	Two redundan Two redundan Two redundan	PCI	Mar 2004 Mar 2004 Mar 2004		
Positioning Processors L3 cache L4 cache Processor upgrade SMP Expansion Module Additional boards	2 x Intel® Xec 2MB or 4MB 64MB XceL4 64MB in each SMP Expansi One SMP Ex L4 cache, sixt Ports) / each One I/O Boar	each prodese each prodese each prodese each prodese each substitution of the each prodese each each each prodese each each prodese each each each each each each each eac	cessor Nocessor Nocessor raccele xpansion lie stand lodule some socket pansion Nocestor Host Br	// P 2.2, 2.7, o / on die of pricator Cache I Module / EC ard / ready for td / two max is, three SMP // odule activat ridge, SCSI, 6	or 3.0GH rocessor (up to 1 CC / 64-b or adding / each c Expans es one I ethernet	Iz¹ with 400 r / at proce 128MB with bit 400MHz g additional contains foun tion Ports (s RXE Expans , graphics,	OMHz from ssor spee optional bus from I processor Intel 603 second mo sion Port ( South Bri	side bud d SMP E Cache ors (up -pin mid dule co one R dge, Su	xpansion and Sca to 8 total cro-PGA 2 nnected v (E Expansion	sion-critical busin orts Hyper-Three Module) / lability Controll ) and memory ZIF sockets for via one or two sion Port suppo slot for Mgmt / Modules, I/O Bo	ading er Xeon M SMP Ex rted)	P, 64MB pansion		
Memory	32 DIMM gold PC2100 DDF (1, 2, 3, or 4-	OGB std / 64GB max <sup>13</sup> (uses standard SMP Expansion Module) / no DIMMs installed / 32 DIMM gold-connector slots / must install two indentical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / Error Checking and Correcting (ECC) and Chipkill™ via Memory ProteXion™ (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / Active Memory™ supporting hot-swap and hot-add (OS specific) and Memory Mirroring™ (non-OS specific)  LSI Logic / Wide Ultra320 SCSI (LVD 32MB/sec) / dual channel / 64-bit 66MHz PCI / integrated RAID-1 on I/O Board												
SCSI disk controller SCSI implementation IDE controller Disk - capacity/bays	LSI Logic / Wide Ultra320 SCSI (LVD 32MB/sec) / dual channel / 64-bit 66MHz PCI / integrated RAID-1 on I/O Board First channel to internal 2-port SCSI backplane for internal hot-swap disks (16-bit LVD cable to SCSI backplane) / second channel to one external .8mm VHDCI 68-pin connector (16-bit LVD cable from I/O Board to ext connector) / one standard (longer) 16-bit LVD cable included for attaching an optional ServeRAID adapter to the two-bay backplane Enhanced IDE ATA-100 controller in South Bridge / one one-drop IDE cable to backplane for diskette and CD-ROM No disks standard / supports up to 15K rpm SCSI disks / two hot-swap bays / converged tray / 80-pin SCA-2 connectors													
Mechanical	EIA 19" rack	models	( <b>4U</b> <sup>4</sup> ) x 2	8" deep / supp	oorted in	NetBAY™	Racks (su	ch as N	letBAY42	SR, NetBAY42	ER)			
` ′	IBM XA-32™ 2nd Generation chipset / IBM Cache and Scalability Controller with L4 cache controller and three SMP Expansion Ports / IBM Memory I/O Controller with two remote I/O ports (each to a IBM PCI-X Host Bridge) / each IBM PCI-X Host Bridge provides three peer PCI buses / PCI 2.2 Bus E supports graphics, adapter slot with Remote Supervisor Adapter, VIA® 82C686B South Bridge (IDE ATA-100, USB, Super I/O PC97317VUL [keyboard, mouse]) / PCI 2.2 Bus F supports SCSI, ethernet / PCI-X Bus A, B, C, D support PCI-X slots / designed to the PCI-X 1.0 specification Six hot-swap PCI-X 1.0 slots¹⁰ available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers One RXE-100 Remote Expansion Enclosure can be shared between two x445 4-way, 8-way, or 16-way xSeries 445 servers or attached alone. Both PCI-X 6-packs must be installed to support RIO sharing as each server will access six additional PCI-X slots.													
Ethernet	<b>Dual</b> Broadco SVGA / ATI®	m <sup>å</sup> 5704 Rage XL 00 Expan	10/100/1 / on I/O sion Port	000 ethernet of Board / 8MB t (to connect	controlle SDRAM optional	er / on I/O Bo I std/max / i RXE-100),	oard / full ou up to 1280 RXE Mar	duplex / 0x1024 nageme	/ 64-bit 66 at 85Hz. nt Port, t	pays / supports SMHz PCI bus / wo USB (Vers ers 1.1)	Wake o	n LAN®		
Security	Power-on and	adminis	trator pa	sswords / una	attended	boot / sele	ectable bo	ot						
Systems mgmt Diagnostics Software	console and i	mgmt / p liagnosti ne Diagn n while s ™ (CD-R	ower on/ cs™ / pr ostics (o server rui lOM inst	off system / rimary indicat perated throunning allation and o	monitors or on in ugh IBM	formation p	tus, op sys panel with IBM Prelo Microso IBM Softw	stem, to LEDs ad Kit f ft Wind are Su	emperatur associate for 1-8 Pr lows Serv bscription	er Datacenter : Update for	power s ompone 48 2003 48	supplies		
Keyboard / mouse Power supplies Cooling fans	None standa Std: two; max watts at 110v front access fans in each Four hot-swa one additiona fan failure sig	rd (beca x: two / h r / redund / worldwi power su p, redund Il fan in e gnals Dia	use rack ot-swap dant at 2: de / volt ipply / Pl dant, mu each pow gnostic I	k-based) / 1200 watts 20v with two age-sensing FA alti-speed fanser supply / P LED and mgr	power s / auto-re s / FA / nt proce	essor	1GB DDR 2GB DDR Xeon MP Xeon MP Xeon MP IBM 73.4G IBM Serve Other opt	PC210 PC210 2.2GHz 2.7GHz 3.0GHz B 10K RAID™	00 ECC S 00 ECC S 2/2MB L3 2/2MB L3 2/4MB L3 Ultra160 S -4H Ultra	ver Datacenter in DRAM RDIMM in RDIMM RDIMM Cache Proc Up SCSI Hot-Swap 160 SCSI Adapt In/pc/us/access	33 og 13 og 13 og 13 og 37	3L5039 3L5040 3N0723 3N0722 3N0721 6P5756 7L6889		
	G6MHz PCI-X G6MHz PCI-X 100MHz PCI-X 133MHz PCI-X 133MHz PCI-X te Supervisor Ar access, diskett access, CD-RG	, hot-swap, hot-swap, hot-swap, hot-swap, hot-swap, hot-swapdp, 32-bit	o Bus A o Bus A o, Bus B o, Bus B o, Bus B o, Bus C o, Bus C o, Bus C o, Bus C	Max weigh Stealth bla Tool-free Access pro Setup Proo Diagnostic SCSISelec Information out Light P diagnostic Predictive XccL4 Ser power sup IBM Direct All model	ns: H178 tt: 110 lb ck color erviceab ocessors nsion Me wer supp gram by ss (PC-D tt by pre: n LED pa ath panes s without Failure A ver Acce plies, an or	mm x W483 s; 50kg billity s, memory, a odule from to plies and dis pressing F1 octor) by pressing Ctrl+A anel and from el (1st and 2 t removing co	adapters, a cop sks from from at startup essing F2 A at startup int-accessified level cover) erts on proche, memo isks with nal disk c	and ont at startu ble pull- cessors ry, fans	Property of the control of the contr	LIMITED WA year parts and ternational War n site, 9 hr x 5 ext day response year on site wa year on site year on site sat warranty ma yervicePac a year wariah ther ServicePac tp://www.ibm.c s/pdf/wamomxe yeriod³ arranty issues arranty period³	labor ranty Se day co se time rranty se n eligib verage, e vailable) intenan le coption om/servu.pdf	ervice <sup>3</sup> verage, ervice le oce as at vices/us/		

IBM® Type-model Qty x		.3 L4 che cache	Memory	Disk	SCSI controller	Mech- anical		SMP/RXE Exp Ports	Hot-swap pwr supplies		Available date
8855-4BY 4 x Itanii 8855-5BY 4 x Itanii 8855-6BY 4 x Itanii	um 2 1.6Ghz 6M	IB 64MB	2GB Chipkill <sup>1</sup> 2GB Chipkill 2GB Chipkill	None	2 x Ultra320	4U rack	6x2	0/1	Two redundan Two redundan Two redundan	t PCI	Dec 2004
Positioning Processors L2 cache L3 cache L4 cache Processor upgrade SMP Exp. Module Additional boards	Up to 16-way por 4 x Intel® Itanium 256KB each proc 4MB, 6MB or 9M 64MB XceL4™ S ECC / 64-bit 400l 4-way SMP per c Up to 16-way us One I/O Board (P PCI Board (PCI-X	n 2™ Proces cessor / on o IB each proc Gerver Accel MHz bus fror chassis sing four x45 PCI-X Host B	sor 1.5GHz of process essor / on dierator Cache and cache and chassis / reridge, SCSI,	or1.6GH sor / at e of pro e Scalab equires etherne	Iz with 400M processor spocessor / at pility Controlle appropriate 8t, graphics, S	Hz fronts beed brocessor r 3-way or South Brid	side bus speed 16-way dge, Su	kits	slot for Mgmt /	Adapter	), one il Board)
Temory  2GB std (using 2 x 1GB DIMMs)/ 56GB max when installing 2GB DIMMs into 28 slots / 28 DIMM gold-connector slots PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2 way interleaving / Active Memory™ with Error Checking and Correcting (ECC), Chipkill™, Memory ProteXion™ (1 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / via memory mirroring (memory mirroring supported with any OS) / Hot-add and Hot-swappable using Microsoft Windows Server 2003											
SCSI disk controller SCSI implementation IDE controller Disk - capacity/bays	ServeRAID adapt Enhanced IDE AT	kplane for in ter and SCSI A-100 contro	ternal hot-swa cable requir ller in South E	ap disks ed if att Bridge/	(16-bit LVD taching externone one one-drop	cable to nal stora IDE cab	SCSI b ge encl e to bad	ackplane osures ckplane fo	) / or diskette and	CD-RO	M
Mechanical	EIA 19" rack mod	dels (4U4) x 2	8" deep / sup	ported i	n NetBAY™ F	Racks (su	ch as N	etBAY42	SR, NetBAY42	PER)	
Chipset  Slots (Active™ PCI-X  RXE Expansion Port	hot replace, hot	Controller with er PCI buses / outh Bridge (IE ports SCSI, e X 1.0 slots <sup>10</sup> a upgrade, h note Expansio	two remote I/ PCI 2.2 Bus I DE ATA-100, Uthernet / PCI- available with pot expansion on Enclosure co	O ports E suppo JSB, Sup X Bus A power au 1 / sepa an be st	(each to a IBN rts graphics, a per I/O PC973 , B, C, D supp nd attention in arated by instanced between	M PCI-X I adapter si 317VUL [i bort PCI-X adicator li ulative pi 1 two x45	Host Brider Host With International Market Properties (1984)   Host Pro	dge) / ead Remote S d, mouse designed tical sens viders , 8-way, o	Supervisor Adap ]) / I to the PCI-X 1 sors control pov r 16-way xSerie	oter, .0 speci ver to slo es 455 se	fication ot) /
CD-ROM / diskette Ethernet Graphics controller Ports	Dual Broadcom® 5	5704 10/100/1 le XL / on I/O xpansion Por	000 ethernet Board / 8MB t (to connect	controlle SDRAM optiona	er / on I/O Bo M 125MHz sto I RXE-100), F	ard / full / d/max / u RXE Man	duplex / ip to 12 agemei	64-bit 66 80x1024 nt Port, tv	SMHz PCI bus at 64K colors vo USB (Vers	Wake of the Wake o	
Security	Power-on and adn	ninistrator pas	swords/unat	tended l	boot/selectab	ole boot					
Systems mgmt Diagnostics Software	Remote Supervis console and mgmt Light Path Diagn IBM Real Time Dia available even wh ServerGuide™ (C utilities), IBM Dire	t / power on/o lostics™ / pri agnostics (op lile server run CD-ROM insta	ff system / mo mary indicato erated throug ning Illation and co	nitors por r on info gh IBM D	ower status, o rmation pane Director) It. It ion It	p system I with LEI anium 2 anium 2 anium 2	, tempe Os asso 1.3GHz 1.4GHz 1.5GHz	rature, dis ciated wi /3MB L3 /4MB L3 /6MB L3	sks, fans, powe	r supplie onents / pg pa	es
Keyboard / mouse Power supplies  Cooling fans	None standard (b Std: two; max: two watts at 110v / rec front access / worl fans in each power Four hot-swap, recone additional fan	pecause rack o / hot-swap / dundant at 22 ldwide / volta er supply / PF dundant, mul	a-based) / US 1050 watts a 0v with two poge-sensing / a A ti-speed fans	t 220v o ower su auto-res /	r 550 pplies / IE tart / IE IE	GB PC21 GB PC21 BM 73.40 BM 146.8 BM Serve BM RXE- way to 8	100 CL2 100 CL2 3B 15K GB 10h RAID™ 100 Re 3-way E	2.5 ECC E 2.5 ECC E Ultra320 ( Ultra320 6M Ultra mote Sto expansion	DDR SDRAM DDR SDRAM SCSI Hot-Swa D SCSI Hot-Swa 320 256MB C rage Enclosure	ap ache	33L5039 33L5040 32P0735 32P0728 02R0988 86841RX 73P9911 73P9715
Bay ② 3.5", 0.5", Bay ③ 3.5", SL 1", Bay ④ 3.5", SL 1",	66MHz PCI-X, hot 66MHz PCI-X, hot 100MHz PCI-X, hot 133MHz PCI-X, hot 133MHz PCI-X, hot ote Supervisor Adp, 3.  4  access, open (Ultraccess, Combo (Uaccess, hot-swap	a-swap Bus A -swap Bus A -swap, Bus B -swap, Bus B -swap, Bus C -swap, Bus C -swap, Bus D 2-bit 33MHz  U Rack  abay 2000)  Jitrabay 2000	Dimension  Max weig  Stealth bla  Tool-free  Access pr  Access pr  SMP Expa  Access pr  Diagnostic  Toflere  Count Light F  diagnostic  Predictive  XceL4 Se  power sup  BM Direc  All mode	ns: H17 ht: 120 ht: 120 cock color servicea ocessor ansion M ower sup gram by cs (PC-E ct by pre n LED p oth pan swithou Failure rver Acc uplies, ar tor	9" x W17.3" x 5mm x W440 lbs; 54.30kg r	D28.1" Dmm x D  dapters, a p ss from freat startup ssing F2 at startup -accessil d level ever) rts on pro e, memo sks with al disk c	713mm and ont at startu ble pull- cessors ry, fans,	Pool ht its way ks	LIMITED WA year parts and ternational Wa M On Site (IOF usiness-Day c year on site w ygrade option ( cations): 24 hr x 7 day cc 26 hour respons 26 P2689 set warranty n services avail ther ServicePa ther ServicePa yetf/www.ibm. s/pdf/wamomx. x714 toll-free s arranty issues warranty perio	labor rranty S i), 9-5 N overage arranty in eligib overage e time naintena able c option com/sereu.pdf upport i during d i a output discounting d i a output d i a out	ervice <sup>3</sup> ext- y service ble , ance as at vices/us/ for the



Blower

module 1 • (std)

Blower

module 2 •

(std)

PM

РМ

4

SN 2

Switch Power modules modules

Dimensions: H12.0" x W17.5" x D28" Dimensions: H304.2mm x W444mm x D711.2mm

Weight: 99 to 240 lb; 44.91 to 108.86kg

Stealth black color bezel

Tool-free customer serviceability

Access HS20 server blades and SCSI Expansion Units from front

Access modules from rear

Midplane in center of system to interface for all major system components

Prédictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

Module	Switch module bay	Switch module function
bays	1	Ethernet link 1 for all blade servers
	2	Ethernet link 2 for all blade servers
	3	Network connection 1 for all blade server
jement dule td)	4	I/O expansion options (Fibre Channel) Network connection 2 for all blade server I/O expansion options (Fibre Channel)

### **LIMITED WARRANTY**<sup>3</sup>

⇒ 3 year parts and labor
 ⇒ International Warranty Service<sup>3</sup>

On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time7 On site service upgrade options (in

eligible locations):<sup>7</sup> 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2074)

3 year IOR 24x7, 4 hr avg response

(ServicePac part num 21P2073)

3 year IOR 9x5, 4 hr avg response (ServicePac part num 21P2072)
5 year IOR 9x5, 4 hr avg response

(ServicePac part num 69P9247)

5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9249) Other ServicePac options at

http://www.ibm.com/services/us/ its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty

issues during the warranty

РМ

PM

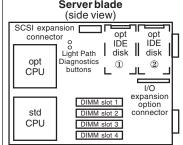
2

(both std)

M 2

Power Managemer modules module

IBM® Type-model Qty x Pro	ocessor1	Memory	Frontside Bus Mhz	L3 Cache	Disk 0	Disk controller	Disk bays		SI suppo nal stor	ort with exp unit		Mech- anical	Required chassis	Available date
	3.06GHz	512MB	533Mhz	0MB	None None None	EIDE EIDE EIDE	2 fixed	2 hc	ot-swap	Ultra320 Ultra320 Ultra320	0x2	7U <sup>4</sup> blade 7U <sup>4</sup> blade 7U <sup>4</sup> blade	BladeCenter	Oct 2003
Positioning Processor(s) L2/L3 Cache SMP support Implementation	Ultra-dense Up to 1 x l 512KB L2 2-way SMF Server blace one SCSI e	Intel® Xe Cache / P / up to de conta	eon 3.2Ğl / 1MB L3 two Xeon ins two Int	Hz with Cache Proces el 604-	533Ml (some) sors (sa pin mic	Hz fronts ) / on die ame spe ro-PGA 2	ide bus e of prod ed/cache ZIF sock	/ Hyp cesso e size ets, fo	per-Three or / at p e) our mer	eading ted rocessor mory DIMN	hnolog speed // slots	y / NetBur two IDE c		tecture
Memory	512MB or 1GB std / 8GB max <sup>13</sup> / two slots used / two slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systembor must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on sar detects 2- through 8-bit errors contained in two chips)											uns at 2 x 100N	1Hz/	
IDE controller/bays	IDE disk / disks / spa	no cable ice for c	e as IDE only one I	disk at DE dis	taches k if an	to riser I/O expa	card and ansion o	d tray ption	inclue) (inclue	ded with o ed [Fibre	option Chann	kit) / Supp el] / <b>RAID</b>	each supports orts max of tw	o IDE tandard
SCSI disk controller	via one co CIOB-ES I	nnector /O Brido	/ LSI Log ge (IMB2	jic® 530 bus to	C1020 Host E	Ultra320 Bridge) /	SCSI c	ontro s <b>R/</b>	ller [L\ <b>\ID-1</b> n	/D 320ME nirroring	sec] / [Embe	/ 64-bit 13 edded Mirr	slot / connects 3MHz PCI-X B oring] with two	us B from hot-swap
SCSI disk bays	Supports m 80-pin SCA	าax of tw	vo hot-swa	ар 3.5"	SL Ultr	a320 SC	SI disks	in op	tional S	SCSI Stor	age Ex	pansion U	ernal connector nit /	)
External storage									IAS fan	nily of prod	ducts)			
Mechanical Architecture / chipsets Bus slots	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)  Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Bridge (memory controller and I/O Bridge) / single-slot cone ClOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip											gle-slot or USB,		
Ethernet controllers	No PCI or									•			ull duplex / Wak	e on I AN®
Network-interface  CD / diskette / USB Kybd / video / mouse Graphics	/ Alert Standswitch or Cone conne 3 and 4 of card) / ethe None / requ	dard Forn Optical F ector for BladeCo ernet and uests for uests for	mat 1.0 / te Passthrough or I/O expenter / all ad serial I/ CD-ROM keyboard	eaming gh Mod ansior blades O expa , disket , mouse	and faile dule (the dule (the faile (the fai	over suppe e second n (Fibre ngle Blad cards plad and US rideo in B	oort / oned control Channed deCente anned fo BB port in BladeCer	e of the ller real Exp r must r futu n Blad nter by	e dual or equires pansion est conta ire relea leCente y press	controllers of a second of Card) / rain the sar ase <sup>20</sup> er by pressing the dis	connect option equireme me exp sing CE play bu	ts to an optical switch of same into cansion can	ional, supporte	d Ethernet s in bays asion atrol panel
Systems mgmt  Diagnostics	IBM integr H8S2148 / monitoring for commun Light Path component	on blade, event renication  Diagno	e / provide ecording, with Blade ostics™ (L	es syste alert ca eCente .ED ligh	em and apability r manag nts indic	environr / / RS-48 gement n cate failir	nental 5 interfa nodule ng	oce	Xeon 3 Xeon 3 512MB 1GB P 2GB P	3.06Ghz/5 3.2Ghz/51 3 PC2100 ( C2100 CL: C2100 CL:	12KB 2KB L: CL2.5 E 2.5 EC 2.5 EC	ECC DDR-S C DDR-SD C DDR-SD	Proc Upg B Proc Upg BDRAM DIMM RAM RDIMM RAM RDIMM	73P9073 73P9074 13N0650 33L5038 33L5039 33L5040
Security Software ship group	Power-on punattended	boot/s	selectable	boot/u	inatten	ded start			IBM HS	S20 Fibre s; each po	Chann rt requ	el Expans ires a FC	on Unit (blade) ion Card (with t Switch Module)	wo 48P7061
Cooling fans Power supply Prerequisites	Documentation CD, IBM Director 4.1 CD, Device Driver CD  Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel Uses power module(s) in BladeCenter (type 8677)  Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system  IBM HS20 40GB <sup>2</sup> 5400 rpm ATA-100 HDD 48P7063 36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD* 06P5768 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* 06P5756 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD* 32P0728 32P0728													
Server b	lade	B	av ① 3.5".	. 9.5mm	n. no froi	nt access	s. option	 al Thi	nkPad <sup>®</sup>	IDE disk	<b>⇒</b> 3 ·	LIMITE year parts	DWARRANT' and labor	<b>/</b> 3



- Powergood
- Blade location
- Overtemperature
- Information
- · General fault

Bay ① 3.5", 9.5mm, no front access, optional ThinkPad® IDE disk Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk

- Stealth black front bezel
   H 9.7" x W 1.14" x D 17.6";
   H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk
- activity, and power Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS20 blade server13: 80GB with two 40GB EIDE disks or 293.6GB\* with two 146.8GB SL SCSI disks

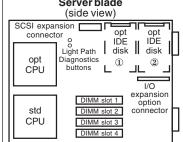
- 3 year parts and labor
   International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response

  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

See footnotes for important warranty information US models announced July 1, 2003 Model withdrawn from marketing effective March 2004

IBM® Type-model Qty x Pro		Disk SCSI support with pays optional stor exp unit	Slots Mech-Required Available x bays anical chassis date								
8832-L1X 1 x Xeon 8832-M1X1 x Xeon			0x2 7U <sup>4</sup> blade BladeCenter Jan 2004 0x2 7U <sup>4</sup> blade BladeCenter Jan 2004								
These models	ship standard with $\textbf{Non-Chipkill DIMMs}.$ Chipkill is $\textbf{o}$	ptionally available with pur	chase of 512MB DIMMs or higher.								
Positioning Processor(s) L2/L3 Cache SMP support Implementation	Ultra-dense, highly manageable modular computing. Up to 1 x Intel® Xeon 3.06GHz with 533MHz frontsic 512KB L2 Cache / on die of processor / at processor 2-way SMP / up to two Xeon Processors (same speed Server blade contains two Intel 604-pin micro-PGA ZIF one SCSI expansion connector, one I/O expansion opt	de bus / Hyper-Threading te or speed Vcache size) Fsockets, four memory DIMN	chnology / NetBurst™ microarchitecture  ### slots, two IDE connectors,								
Memory	512MB Non-Chipkill std / 8GB max¹³ / two slots used / two slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / 16-bit Checksum Chipkill™ optionally available for configurations 1GB and above										
	via one connector / LSI Logic® 53C1020 Ultra320 S CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / su 3.5" one-inch high SL SCSI disks in front bays / one	ird and tray (included with of sion option installed [Fibre of the control of the	option kit) / Supports max of two IDE Channel] / RAID-1 mirroring standard g adjacent blade slot / connects to HS20 B/sec] / 64-bit 133MHz PCI-X Bus B from [Embedded Mirroring] with two hot-swap to cables or external connector)								
SCSI disk bays External storage	Supports max of two hot-swap 3.5" SL Ultra320 SCSI 80-pin SCA-2 connectors / all SCSI bays Ultra320-er Support for IBM TotalStorage™ solutions (including F.	nabled									
Mechanical			,								
Architecture / chipsets	ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Bridge (memory controller and I/O Bridge) / single slot Architecture / chipsets one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip										
Ethernet controllers  Network-interface  CD / diskette / USB Kybd / video / mouse	Two gigabit Ethernet controllers / Broadcom® BCM5704S / Alert Standard Format 1.0 / teaming and failover suppor switch or <i>Optical Passthrough Module</i> (the second of <b>One connector for I/O expansion option</b> (Fibre C 3 and 4 of BladeCenter / all blades in a single Bladecard) / ethernet and serial I/O expansion cards plant None / requests for CD-ROM, diskette drive, and USB None / requests for keyboard, mouse, and video in Blart.	rt / one of the dual controllers of controller requires a second hannel Expansion Card) / ri Center must contain the sar ned for future release <sup>20</sup> port in BladeCenter by press	connects to an optional, supported Ethernet optional switch or OPM) equires same interface modules in bays me expansion card (or no expansion sing CD select button on front control panel								
Graphics	SVGA / ATI® Rage XL / on blade / 8MB SDRAM std/ma										
Systems mgmt  Diagnostics	IBM integrated system management processor (IS H8S2148 / on blade / provides system and environme monitoring, event recording, alert capability / RS-485 i for communication with BladeCenter management mo Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor	ental Xeon 3.06Ghz/5 interface 512MB PC2100 C dule DDR-SDRAM RE 1GB PC2100 CL2 rin BIOS) 2GB PC2100 CL2	2.5 ECC DDR-SDRAM RDIMM 33L5039 2.5 ECC DDR-SDRAM RDIMM 33L5040								
Security	Power-on password / administrator password /	IBM HS20 Fibre	Storge Expansion Unit (blade) 48P7058 Channel Expansion Card (with two								
Software ship group	unattended boot / selectable boot / unattended start mode ports; each port requires a FC Switch Module) 48P7061   p Documentation CD, IBM Director 4.1 CD, Device Driver CD   IBM HS20 40GB <sup>2</sup> 5400 rpm ATA-100 HDD 48P7063										
Cooling fans Power supply Prerequisites	on each processor and BladeCenter modules and front panel Uses power module(s) in BladeCenter (type 8677)  36.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* 06P5776  73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* 06P5776										
			LIMITED WARRANTY <sup>3</sup>								
	Server blade  Bay ① 3.5", 9.5mm, no front access, optional ThinkPad®IDE disk  Side view)  Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk  International Warranty Service®										



A control panel on top front of blade has following LEDs:

- Powergood
- Blade location
- Overtemperature
- Information

General fault

Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk

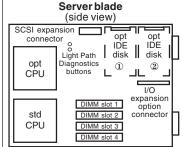
- Stealth black front bezel
   H 9.7" x W 1.14" x D 17.6";
   H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS20 blade server13: 80GB with two 40GB EIDÉ disks or 293.6GB\* with two 146.8GB SL SCSI disks

- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response
  - (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

IBM® Type-model Qty x Pro	cessor1	Memory	Frontside Bus Mhz		Disk	Disk controller	Disk bays		SI support wit nal stor exp u		Slots x bays	Mech- anical	Required chassis	Available date
8832-J1X 1 x Xeon	3.2GHz	1GB	533Mhz	2MB	None	EIDE	2 fixed	2 ho	ot-swap Ultra	a320	0x2	7U4 blade	BladeCenter	Feb 2004
Positioning	I Iltra-der	se hiahl	v manage	eable n	nodula	r comput	ina nlatt	form	with superio	r nei	rformai	nce		
Processor(s) L2/L3 Cache	1 x Intel	® Xeon 3.	. <b>2GHz</b> witl	h 533N	1Hz fro	ntside bu	ıs ॅ∕ Нур∈	er-Thr		nólog			icroarchitecture	9
SMP support Implementation	Server bl	ade conta		tel 604-	pin mìo	cro-PGA 2	ZIF sock	ets, fo	e) our memory I tor, and integ					
Memory			ax <sup>13</sup> / two s											
	must be i Error Ch	nstalled ir <b>ecking a</b> ı	n matched	pairs [a ting (E	a bank] CC) vi	/ 2-way r a <b>16-bit C</b>	memory Checksu	interle	eave / dual čl	nann	el/me	mory bus r	n systemboard / runs at 2 x 100l rrors on same c	ЛHz/
IDE controller/bays	IDE disk	/ no cabl	e as IDE	disk at	taches	to riser	card an	ď tray	(included v	vith (	option	kit) / Supp	each support	o IDE
SCSI disk controller	None / s via one o CIOB-ES	upports connector I/O Brid	optional / LSI Log ge (IMB2	SCSI Signific® 539 bus to	Storag C1020 Host	<b>e Expan</b> Ultra320 Bridge) /	sion Ur SCSI o support	nit (a contro s <b>R/</b>	blade occup ller [LVD 32 <b>AID-1 mirro</b> i	oying OME r <b>ing</b>	g adjad 3/sec] / [Embe	ent blade 64-bit 13 dded Mirr	-1 mirroring s slot / connect 3MHz PCI-X E oring] with two	s to HS20 Bus B from hot-swap
SCSI disk bays	Supports	max of tv		ар 3.5"	SL Ult	ra320 SC	SI disks	in op	ernal channotional SCSI				ernal connecto Init /	r)
External storage									IAS family of	prod	ducts)			
Mechanical													NetBAY™ Rac	
Architecture / chipsets	one CIOI ethernet	BE-S I/O and the I	Bridge (III O expans	MB2 bเ sion op	is to Hotion co	ost Bridg onnector	je) for tv / CSB6-	vo PO ·U So	CI-X Buses v uth Bridge (	viťh Thin	Bus A IMB t	for ethern o Host Bri	D Bridge) / sing et and Bus B dge) for EIDE, PC87417 Supe	for USB,
Bus slots									erface option				007417 Supe	i i/O cilip
Ethernet controllers	/ Alert Sta	ındard For	mat 1.0 / te	eaming	and fai	lover supp	oort / one	e of th		llers	connec	ts to an op	full duplex / Waktional, supporte	
Network-interface	One con 3 and 4 d	nector for of BladeC	or I/O exp enter / all	<b>bansio</b> i blades	n <b>optic</b> s in a s	<b>on</b> (Fibre ingle Blac	Channe deCente	el Exp er mus	pansion Card at contain the	d) / r e sar	equire	s same int	terface module rd (or no expa	
CD / diskette / USB Kybd / video / mouse Graphics	None / re None / re	quests for quests for	r CD-ROM r keyboard	l, diske l, mous	tte driv e, and	e, and ÙS video in E	SB port ir SladeCer	n Blac nter b	re release <sup>20</sup> leCenter by p y pressing th I3MHz PCI 2	oress e dis	play bu	select but utton on fro	tton on front co ont control pane	ntrol panel I
Systems mgmt	H8S2148	3 / on blad	rstem mai le / provide recording,	es syste	em and	denvironr	nental		Xeon 3.2Gh Proc Upg				3 Cache SDRAM DIMM	13N0743 33L5038
Diagnostics	for comm Light Pa	unication <b>th Diagn</b> o	with Blade ostics™ (L n-board di	eCente .ED ligl	r mana hts indi	ıgement r cate failir	nodule ng		1GB PC2100 2GB PC2100	CL CL	2.5 EC 2.5 EC	C DDR-SD C DDR-SD	PRAM RDIMM PRAM RDIMM on Unit (blade	33L5039 33L5040
Security			rd / admini selectable				t mode		IBM HS20 F ports; eac	ibre h po	Chann rt requ	el Expans ires a FC	ion Card (with Switch Module	two ) 48P7061
Software ship group			D, IBM Dir					)	IBM HS20 4 36.4GB 15K				-100 HDD Swap SL HDD*	48P7063 06P5768
Coolingfans			BladeCer and Blade						36.4GB 15K	Ultra	a320 S	CSI Hot-Sv	vap SL HDD* Swap SL HDD*	06P5776
Power supply Prerequisites	Uses pov Monitor,	ver modul keyboard	le(s) in Bla , mouse fo (type 867)	deCer r setup	iter (typ ; ether	oe 8677) net switc	·		146.8GB 10	K Ul	tra320	SCSI Hot-	Swap SL HDD Swap SL HDD Dansion Unit	
				-								LIMITE	DWARRANT	<b>Y</b> <sup>3</sup>
Sorverh	lada	Р	0 0 F	0 Em-	no fra	nt 00000	o ontion	al Thi	pkDod®IDE	ما: ماد	~ 2,	oor norte	and labor	



- Powergood
- Blade location
- Overtemperature
- Information
- · General fault

Bay ① 3.5", 9.5mm, no front access, optional ThinkPad®IDE disk Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk

- Stealth black front bezel
   H 9.7" x W 1.14" x D 17.6";
   H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup Blade control panel on each HS20 blade server provides
- media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS20 blade server13: 80GB with two 40GB EIDE disks or 293.6GB\* with two 146.8GB SL SCSI disks

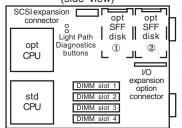
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response
  - (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

IBM®	L2 I	FSB	Disk		SCSI Supp	ort with	slots	Mech-		Available
Type-GAV-model Proce	essor GHz1 cache I	MHz Memory Disk	controller		optional stor	r exp unit	x bays	anical	Ethernet	date
8843-01y-01x 1 x 2 8843-11y-11x 1 x 2 8843-21y-21x 1 x 2 8843-31y-31x 1 x 2 8843-41y-41x 1 x 2 8843-L1y-L1x 1 x 2	(eon 3.2 1MB 8 (eon 3.4 1MB 8 (eon 3.6 1MB 8 (eon 2.8 LV 1MB 8	300 1GB None 300 1GB None 300 1GB None 300 512MB None		2-fixed 2-fixed 2-fixed 2-fixed	2 Hot-swap l 2 Hot-swap l 2 Hot-swap l 2 Hot-swap l 2 Hot-swap l 2 Hot-swap l	Jltra320 Jltra320 Jltra320 Jltra320	0 x 2 7 0 x 2 7 0 x 2 7 0 x 2 7	'U blade 'U blade 'U blade 'U blade	2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit 2 x Gigabit	Sept 2004 Sept 2004 Sept 2004 Sept 2004 Sept 2005
Drococce(a)		ull density popula			•				hroor Throodin	a toobnology
Processor(s) SMP - L2 Cache Implementation	2-way SMP / up to Systemboard conta	to 3.6 GHz with 80 Volage Processor of two Xeon Processor ins two Intel 604-pin connector, integrated of	's (same sp micro-PGA	eed/cache ZIF socke	size) / <b>1MB</b> s ts, four DIMM	ter rack destd and m	ensity whax / at presented to see the second control of the second	nile utilizin rocessor s xpansion	g existing facil speed connector, on	ig technology ities e I/O
Memory	512MB/1GB std / 8 PC2-3200 400MHz installed in matched	<b>GGB</b> <sup>13</sup> max / two slots CL2.5 ECC DDR2-9 D pairs [a bank] / 2-wa	used / two SDRAM DIN ay memory	slots availa /IMs / four i interleave /	able / 240 pin gold-c dual channel	connector	slots on	systembo	ard / DIMMs r	must be
SCSI disk controller	LSI Logic® 53C102 PCI-X / supports Ruchannel: one 2-dror	20 SCSI controller / SAID-1 & 1E mirroring	ingle chan g (supporte	<b>nel Ultra32</b> d in 32-bit l	20 SCSI contr egacy mode o	r <b>oller</b> (LVI only) / On	D 320ME e 16-bit d	B/sec) / or channel (c	n planar / 64-b one internal) /	it 100MHz <i>Internal</i>
SCSI Disk bays	Two 2.5-inch Sma disks in optional SC	AID-1 & 1E mirrorin o 16-bit 68-pin LVD S III Form Factor (SFF CSI Storage Expansion	) Ultra320 i n Unit (80-	nternal fixe	d disk bays / s connectors; <b>al</b>	Supports r	max of tv <b>ıys Ultra</b> :	vo hot-swa <b>320-enab</b>	ap 3.5" SL Ult <b>led</b> ) /	ra320 SCSI
External Storage	Support for IBM To	talStoragĕ™ solutions	(including	FAStT and	NAS family o	f products	5)			
Mechanical Architecture/Chipset	7U Blade / Support Intel E7520 chipse BUS / ICH5R suppointerface	ed in IBM BladeCent t / E7525 MCH (Mer orts USB (1.0) / LSI 1	er 8677-3XX nory Contro 020 / Dual	X or 8677-1 oller Hub) fo Broadcom	XX/2XX (requor PCI-Express 5704S / Low F	iires upgra s bridge to Pin Count	ade to 20 DPXH, IC Interface	00W pow CH5R / PX / NS PC8	er supply option XH BUS supp 37366 Super I	on 26K4816) orts PCI-X 'O off LPC
BUS slots		lots (expansion via m	odules or n	etwork-inte	rface option o	onnector)				
Network Interface  CD / Diskette / USB Kybd / video / mouse Graphics controller	or Optical Passthro One connector for 3 and 4 of BladeCe and serial I/O expa None / requests for	I/1000 ethernet control  -X 64-bit 100MHz / funce / Load balancing  nugh Module (the sec  r I/O expansion opt  enter / all blades in a second cards planned  c CD-ROM, diskette control  keyboard, mouse, a  con™ 7000M on Plana	or teaming in teaming in the controll in the control in	/ one of the ler requires Channel Ex Center mu lease <sup>20</sup> SB port in l	e dual controlle a second opti pansion Card) st contain the BladeCenter b	ers connectional switch  or requires  same exp	cts to an och or OP s same i cansion can och	optional, s M) nterface r ard (or no ect button	nodules in ba expansion ca on front contr	ernet switch ys ird) / ethernet
Systems Mgmt	recording, alert cap	anagement Control ability / RS-485 interf one with B	ace for		/ on blade / pr	rovides sy	rstem and	d environr	mental monito	ring, event
Diagnostics	Light Path Diagno component) and or BIOS)	ostics™ (LED lights in the light in the ligh	ndicate failir via PC-Doc	ng tor in	Xeon 3.0 Gl	Hz/800/1N	/IB L2 Ca	ache EM6	4T Proc Upg 4T Proc Upg 4T Proc Upg	13N0692 13N0693 13N0657
Security	administrator passv	n protection / Power- vord / unattended boo nattended start mode	on passwo ot /	rd /	Xeon 3.4 Gl	Hz/800/1N Hz/800/1N	/IB L2 Ca /IB L2 Ca	ache EM6 ache EM6	4T Proc Upg 4T Proc Upg	13N0658 13N0659 73P3522
Software ship group	Documentation CD	, Broadcom CD			1GB (2x512	?) PC2-32(	00 CL3 E	ECC DDF	R2 nipK RDIMM I	73P3522
Cooling Fans	Uses cooling from	BladeCenter (type 86 and BladeCenter mo	677) / therm	al sensors	4GB (2x2GE IBM 36.4GB	3) PC2-32	200 ECC	DDR2 Ch	nipK RDIMM I	Kit 73P2867 90P1312
Power supply(s) Prerequisites	Uses power module Monitor, keyboard,	e(s) in BladeCenter ( mouse for setup; eth type 8677), operating	type 8677) ernet switcl		IBM 73GB 1 BladeCenter BladeCenter BladeCenter BladeCenter BladeCenter BladeCenter	10K Ultra3 r SCSI Sto r SFF Fibr r SFF Gio	320 SCSI orage Exp re Chann pabit Ethe	2.5" SFF p Unit lel Exp Ca ernet Exp	NHS HDD ard Card	90P1313 26K4817 26K4841 26K4842 02R9080
		optional 2.5-inch SF			BladeCenter 17-inch Flat Other option	Panel Mo	nitor Cor	isole Kit v	v/ US Kybd	26K4817 17231UX

Bay 2 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk

### Server blade (side view)



A control panel on top front of blade has following LEDs:

- Power good
- Blade location
- Over temperature
- General fault
- Information

- Stealth black front bezel

- Stealth black front bezel
   H 9.7" x W 1.14" x D 17.6";
   H 24.5cm x W 2.9cm x D 44.6cm
   12 lbs; 5.4kg (max configuration)
   Configuration/Setup Utility:F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
   System Partition Boot: ALT+F1 at startup
   Network Boot: F12 at startup
   PXE Boot Agent Utility: Ctrl+S at startup
   Blade control panel on each HS20 blade

- ➡ Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk
- activity, and power Predictive Failure Analysis® alerts on memory, processor(s) and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS20 blade server<sup>13</sup>: 146GB with two 73GB SCSI disks (with BladeCenter SCSI

### **LIMITED WARRANTY**<sup>3</sup>

- 2 3 year parts and labor
  International Warranty Service<sup>3</sup>
  On site, 8 am-5 pm,
  Mon-Fri excluding holidays,
  next business day response time
  On site service upgrade
  options (in eligible locations):<sup>7</sup>
   4 year IOR 9x5, NBD response
  (ServicePac<sup>®</sup> part num 69P9520)
   4 year IOR 9x5, 4 hr avg response
  (ServicePac part num 69P9521)
   4 year IOR 24x7, 4 hr avg
  response

  - response (ServicePac part num 69P9522) 4 year IOR 24x7, 2 hr avg
- response
  (ServicePac part num 69P9523)
  Other ServicePac options at http://www.ibm.com/
  services/us/its/pdf/wamomxeu.pdf
  24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

Storage Expansion Unit 2 x 146GB for total of 438GB)

L3

Frontside

Disk

Disk

SCSI support with

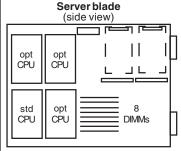
Required

Available

Mech-

Slots

Type-model Qty x Pro	ocessor1	L3 Cache Memory	Frontside Bus Mhz	Disk C	Disk controller	Disk bays		SI suppo Ial expai	ort with nsion unit		Mech- anical	Required	Available date
8839-41X 1 x Xeon <sup>T</sup>		-	400Mhz				-				6U⁴ blade	BladeCente	r Mar 2004
Positioning Processor(s) L2/L3 cache SMP support Implementation	1 x Intel® > 512KB L2 4-way SMF Server blace	e, highly mana Keon 2.8GHz I Cache / 2MB P / up to four de contains fou expansion unit	<b>MP</b> with 40 <b>L3 Cache</b> Keon MP I Ir Intel 604	00MHz · / on d Proces: 4-pin m	frontside lie of pro sors (san nicro-PG/	e bus / cessor me spe A ZIF s	Hyper- / at pred/cad sockets	Thread rocesso the sizes, eight	ding techror speed e) t memory	nológy /	NetBurst™		
Memory	PC2100 26 DIMMs mus 100MHz / I	16GB max <sup>13</sup> / to 66MHz register st be installed <b>Error Checkin</b> and detects 2-	ed 184-pir in matche g and Co	n ECC d pairs rrectin	DDR-SE [a bank <b>g (ECC</b> )	ORAM [ ] / 2-wa <b>)</b> via <b>16</b>	DIMMs ly mer <b>3-bit C</b>	s / eigh nory in checks	t DIMM ( terleave / <b>um Chip</b>	<sup>7</sup> dual c <b>kill</b> ™ (d	hannel / m corrects 1,	emory bus ru	ns at 2 x
SCSI disk controller SCSI disk bays External storage	via one cor CIOB-ES I/ 3.5" one-in- Supports m 80-pin SCA	pports option nnector / LSI L /O Bridge (IME ch high SL SC nax of two hot-s -2 connectors IBM TotalStor	ogic® 530 32 bus to SI disks i wap 3.5" ( all SCSI	C1020 I Host B n front SL Ultra <b>bays U</b>	Ultra320 bridge) / bays / c a320 SC <b>Iltra320-</b>	SCSI of support one 16- SI disks enable	contro ts RA bit into s in op	ller [LV \ID-1 n ernal c tional S	/D 320MI nirroring hannel / SCSI Stor	3/sec] / [Embe no cabl age Ex	64-bit 136 dded Mirro les or exte	BMHz PCI-X I oring] with two rnal connecto	Bus B from o hot-swap
Mechanical Architecture / chipsets Bus slots	ServerWor sone CIOB- ethernet ar bus to Sup	n IBM BladeCe rks® Grand Cl X2 I/O Bridge nd the I/O expa er I/O, and PC PCI-X slots (e	hampion <sup>TI</sup> (IMB2 bus ansion opt II 2.2 Bus	M 4.0 L S to Ho Sion cor C with	.E / CMI st Bridge nnector / n graphic	C-LE5 <sup>*</sup> e) for to CSB6 s contr	Host I wo PC South oller /	Bridge I-X Bu Bridge Nation	(memory ses with e (Thin II) aal Semic	Control Bus A MB to Feonduct	ller and I/0 for etherne lost Bridge or® PC874	D Bridge) / doet and Bus B	ouble slot for ISB. LPC
Ethernet controllers  Network-interface	Wake on LA 4-port GB I Two conne	10/100/1000 et AN® / Alert Stand Ethernet Switch ectors for I/O n a single Blac	dard Forma h <i>Module</i> expansior	at 1.0 / t (the se n <b>optio</b>	eaming a cond co n / requi	and failo ntroller res san	ver sup requir ne inte	oport/c es a se erface r	one of the econd op nodules i	controlletional E n bays	ers connect thernet Sv 3 and 4 of	s to an optiona vitch Module)	վ ՝
CD / diskette / USB Kybd / video / mouse Graphics	None / requ	lests for CD-RO uests for keybo I® Radeon 700	oard, mous	se, and	l video ir	n Blade	Cente	r by pr	essing the	ĕ displa	ay button o		
Systems mgmt  Diagnostics	/ on blade a event record communication Light Path	rated Basebood / provides sys rding, alert capation with Blad a Diagnostics ) and on-board	tem and e pability / F eCenter n ™ (LED lig	nvironi RS-485 nanage Jhts inc	mental n interfac ment mo dicate fai	nonitori e for odule iling	ng,	512MB 1GB PO 2GB PO IBM HI IBM HI	PC2100 C2100 CL C2100 CL S40 SCS S40 Fibre	CL2.5 E 2.5 EC 2.5 EC I Storg e Chan	C DDR-SDI C DDR-SDI e Expansionel Expansi	DRÄM DIMM RAM RDIMM RAM RDIMM on Unit (blade sion Card (wit	h two
Security Software ship group	unattended	password / ad I boot / selecta ation CD, IBM	able boot /	unatte	ended sta		de CD	36.4GE 36.4GE 73.4GE	3 15K Ulti 3 15K Ultr 3 10K Ulti	ra160 S a320 S ra160 S	SCSI Hot-S CSI Hot-Sw SCSI Hot-S	Switch Module wap SL HDD* ap SL HDD* wap SL HDD*	06P5768 06P5776 06P5756
Cooling fans Power supply Prerequisites	on each pro Uses powe Monitor, ke	ng from BladeCocessor and Bler module(s) in eyboard, mous eCenter (type	adeCenter BladeCe e for setu	modul nter (ty p; ethe	les and f pe 8677 ernet swi	ront pa 7)	nel					Swap SL HDD ansion Unit	* 32P0728



A control panel on top front of blade has following LEDs:

- Powergood
- Blade location
- Overtemperature
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- General fault

- Stealth black front bezel
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- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS40 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk
- activity, and power Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

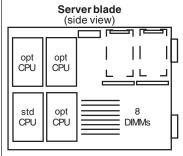
Maximum internal disk capacity for each HS40 blade server13: 293.6GB\* with two 146.8GB SL SCSI disks

### **LIMITED WARRANTY**3

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 69P9518)

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  - (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

IBM® Type-model Qty x Pro	L3 ocessor¹ Cach	ne Memory	Frontside Bus Mhz	Dis Disk contr			SCSI suppo tional expa		Slots x bays		Required chassis	Available date
8839-51X 1 x Xeon <sup>T</sup> 8839-61X 1 x Xeon <sup>T</sup> 8839-71X 1 x Xeon <sup>T</sup>	<sup>™</sup> 2.7GHz MP 2M <sup>™</sup> 3.0GHz MP 4M	IB 2GB IB 2GB		None No None No	ne No	one 2 one 2		Ultra320 Ultra320	0x2 0x2	7U <sup>4</sup> blade 7U <sup>4</sup> blade 7U <sup>4</sup> blade	BladeCenter BladeCenter BladeCenter	Mar 2004
Positioning Processor(s) L2/L3 cache SMP support Implementation	Ultra-dense, hig 1 x Intel® Xeon I 512KB L2 Cach 4-way SMP / up Server blade cor connector, two I	MP up to 3 ne / Up to o to four X ntains four	3.0GHz with 4MB L3 ( eon MP P 1ntel 604-	n 400MHz Cache / or rocessors pin micro-	frontsid die of same) PGA 2	le bus / f proces s speed/ ZIF sock	Hyper-Thresor / at pi cache siz cets, eight	eading tech rocessor s e) memory	nnology speed DIMM	/ NetBurst slots, one		
Memory	Up to 2GB std / PC2100 266MH: DIMMs must be 100MHz / Error same chip and of	z registere installed in Checking	ed 184-pin n matched <b>g and Cor</b>	ECC DDF pairs [a b recting (E	R-SDR. ank] / E <b>CC)</b> vi	AM DIM 2-way r ia <b>16-bi</b>	IMs / eigh nemory in t Checks	t DIMM g terleave / um Chipk	old-cor dual c kill™ (c	nnector slo hannel / m corrects 1,	emory bus rur	ns at 2 x
SCSI disk controller	None / support via one connect CIOB-ES I/O Br 3.5" one-inch his Supports max of 80-pin SCA-2 co	or / LSI Loridge (IMB) gh SL SC f two hot-sv	ogic <sup>®</sup> 53C <sup>.</sup> 2 bus to F SI disks in wap 3.5" S	1020 Ultra lost Bridg front bay L Ultra320	320 S(e) / su s / one SCSI	CSI cor pports • 16-bit disks in	troller [LV <b>RAID-1 n</b> internal c	/D 320ME <b>nirroring</b> hannel / r	/sec] / [Embe lo cabl	64-bit 133 dded Mirro es or exte	BMHz PCI-X E oring] with two rnal connector	Bus B from hot-swap
External storage	Support for IBM						d NAS fam	nily of proc	lucts)			
Mechanical  Architecture / chipsets  Bus slots	Supported in IBM ServerWorks® (sone CIOB-X2 I/O ethernet and the bus to Super I/O No PCI or PCI-2	<b>Grand Ch</b> O Bridge ( e I/O expa O, and PCI	<b>ampion</b> ™ IMB2 bus nsion option I 2.2 Bus 0	4.0 LE / to Host B on connec C with gra	CMIC- ridge) tor / C phics o	LE5 Ho for two SB6 Sc controlle	st Bridge PCI-X Bu outh Bridger er / Nation	(memory ses with E e (Thin IM al Semico	contro Bus A IB to F onduct	ller and I/0 for etherne lost Bridge or® PC874	O Bridge) / do et and Bus B f e) for EIDE, U	uble slot or SB, LPC
Ethernet controllers  Network-interface  CD / diskette / USB	Four gigabit 10/10 Wake on LAN® / / 4-port GB Ethen One connector blades in a singl None / requests	Alert Stand net Switch for I/O ex le BladeCe	ard Format Module (t cpansion c enter must	1.0 / team the second option / re contain th	ing and d contro equires ne sam	l failover oller rec s same i ne expai	support / d quires a se nterface n nsion card	one of the o econd opti nodules in I (or no ex	controlle onal E bays cpansic	ers connect thernet Sw 3 and 4 of on card)	s to an optional vitch Module) BladeCenter	/ all
Kybd / video / mouse Graphics	panel None / requests f SVGA / ATI® Ra										nt control pane	I
Systems mgmt  Diagnostics	Intel integrated / on blade / provevent recording, communication Light Path Diag component) and	vides systo , alert cap with Blade gnostics™	em and er ability / Rs Center ma (LED ligh	nvironmen S-485 inte anagemer nts indicat	tal moi rface f it modi e failin	nitòring, for ule g	Xeon 2 Xeon 2	2.7Ghz/2N	1B L3 (	Cache Pro Cache Pro Cache Pro	c Upg	13N0656 13N0655 13N0654
Security Software ship group	Power-on passy unattended boot	word / adr t / selectal	ministrator ble boot /	password unattende	l / d start	mode	512MB 1GB P0 2GB P0	PC2100 ( C2100 CL2 C2100 CL2	CL2.5 E 2.5 EC 2.5 EC	CC DDR-S DDR-SDI DDR-SDI	SDRAM DIMM RAM RDIMM RAM RDIMM on Unit (blade)	33L5038 33L5039 33L5040 26K4847
Cooling fans Power supply Prerequisites	Uses cooling from on each process Uses power mo Monitor, keyboa disk, BladeCent	sor and Bla dule(s) in ird, mouse	deCenter BladeCen for setup	modules a iter (type i ; ethernet	nd fror 8677) switch	nt panel	36.4GE 36.4GE 73.4GE 146.8G	S40 Fibre s; each po 3 15K Ultra 3 15K Ultra 3 10K Ultra 6B 10K Ult	Chan rt requ a160 S a320 S0 a160 S ra320	nel Expansires a FC S CSI Hot-S CSI Hot-Sw CSI Hot-S SCSI Hot-S	sion Card (with Switch Module) wap SL HDD* rap SL HDD* wap SL HDD* Swap SL HDD*	n two ) 48P7061 06P5768 06P5776 06P5756



- Powergood
- Blade location
- Overtemperature
- Information
- General fault

- Stealth black front bezel
- ⇒ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS40 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS40 blade server13: 293.6GB\* with two 146.8GB SL SCSI disks

### **LIMITED WARRANTY**<sup>3</sup>

3 year parts and labor

Disk requires SCSI Storage Expansion Unit

- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response
  - (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at http://www.ibm.com/
- services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

L3

Frontside

Disk

Disk

SCSI support with

IBM<sup>®</sup>

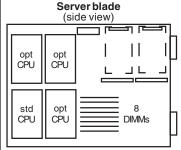
Required

Available

Mech-

Slots

Type-model Qty x Pro	ocessor1	Cache Memory	Bus Mhz	Disk 0	controller	bays		nal expai			anical	chassis	date
8839-21X 1 x Xeon <sup>T</sup>	™ 2.0GHz M	IP 1MB 1GB	400Mhz	None	None	None	2 ho	ot-swap	Ultra320	0x2	7U⁴ blade	BladeCenter	Apr 2004
Positioning Processor(s) L2/L3 cache SMP support Implementation	1 x Intel® 2 512KB L2 4-way SMI Server blace	e, highly mana Xeon 2.0GHz N Cache / 1MB I P / up to four X de contains fou expansion conne	IP with 40 L3 Cache Geon Proc r Intel 60-	00MHz / on d essors 4-pin m	frontside lie of pro (same s nicro-PG	e bus / cessor speed/c A ZIF s	Hyper / at p ache socket	r-Thread rocesso size) s, eight	ding technor speed to memory	ology /	<sup>'</sup> NetBurst™ slots,		cture
Memory	PC2100 26 DIMMs mu 100MHz / I	16GB max <sup>13</sup> / tv 66MHz registere st be installed i <b>Error Checkin</b> e and detects 2-	ed 184-pii n matche <b>g and Co</b>	n ECC d pairs <b>rrectin</b>	DDR-SE a bank] <b>g (ECC</b> )	DRAM I ] / 2-wa <b>)</b> via <b>16</b>	DIMM: ay mei <b>6-bit (</b>	s / eigh mory in <b>Checks</b> :	it DIMM g terleave / <b>um Chipl</b>	dual c kill™ (d	hannel / m corrects 1,	emory bus rur	ns at 2 x
SCSI disk controller SCSI disk bays	via one col CIOB-ES I. 3.5" one-in	pports optiona nnector / LSI L /O Bridge (IMB ich high SL SC nax of two hot-s	ogic® 530 2 bus to SI disks i	C1020 I Host B n front	Ultra320 Bridge) / bays / c	SCSI suppor ne 16-	contro ts <b>R/</b> bit int	oller [LV <b>AID-1 n</b> ernal cl	/D 320ME <b>nirroring</b> hannel / r	3/sec] / [Embe no cab	64-bit 133 dded Mirro les or exte	BMHz PCI-X E oring] with two rnal connector	Bus B fron hot-swap
External storage	80-pin SCA	A-2 connectors / IBM TotalStora	all SCSI	bays U	Iltra320-	enable	d			-	parision or	111.7	
Mechanical		in IBM BladeCer									as the IBM	NetBAY™ Rac	k products
Architecture / chipsets	ServerWo sone CIOB- ethernet ar bus to Sup	rks® Grand Ch	ampion™ IMB2 bus Insion opt I 2.2 Bus	M 4.0 L s to Ho sion cor C with	.E / CMI est Bridge nnector / n graphic	C-LE5 e) for to CSB6 s contr	Host wo PC Soutl oller /	Bridge CI-X Bu h Bridge Nation	(memory ses with le e (Thin IN nal Semice	contro Bus A IB to H onduct	oller and I/C for etherne Host Bridge or® PC874	D Bridge) / do et and Bus B f e) for EIDE, U	ouble slot for SB, LPC
Ethernet controllers		: 10/100/1000 eth	•						•		,	MHz buses / ful	II duplex /
Network-interface CD / diskette / USB	Wake on LA 4-port GB One conne blades in a None / req	AN® / Alert Stand Ethernet Switch ector for I/O ex a single BladeC uests for CD-R	lard Forma Module <b>(pansion</b> enter mus	at 1.0 / t (the se <b>optior</b> st conta	teaming a cond count n / require ain the sa	and failo ntroller res sam ame ex	ver su requir ne inte pansi	pport / c res a se erface n on card	one of the econd opt nodules ir I (or no ex	controllional E tonal E bays xpansio	ers connect thernet Sw 3 and 4 of on card)	s to an optional ritch Module) BladeCenter	/ all
Kybd / video / mouse Graphics		uests for keyboa I® Radeon 700										nt control pane	el
Systems mgmt  Diagnostics	/ on blade event reco communica Light Path	rated Baseboa / provides syst rding, alert cap ation with Blade Diagnostics <sup>11</sup> ) and on-board	em and e ability / F eCenter n // (LED lig	nvironi RS-485 nanage Jhts inc	mental n interface ment me dicate fai	nonitòri e for odule iling	ng, ´	512MB 1GB P	PC2100 ( C2100 CL	CL2.5 E 2.5 EC	C DDR-SDI	DRAM DIMM RAM RDIMM	13N0651 33L5038 33L5039
Security Software ship group	unattended	password / adı d boot / selecta ation CD, IBM	ble boot /	unatte	ended sta			IBM HS	S40 SCS S40 Fibre	Storg Chan	e Expansionel Expans	RAM RDIMM on Unit (blade sion Card (with Switch Module)	h two
Cooling fans Power supply Prerequisites	on each pro Uses power Monitor, ke	ng from BladeC ocessor and Blader module(s) in eyboard, mouse eCenter (type 8	adeCenter BladeCe for setu	modul nter (ty p; ethe	les and f pe 8677 ernet swi	ront pa 7)	nel	36.4GE 36.4GE 73.4GE 146.8G	3 15K Últr 3 15K Ultra 3 10K Ultr 3B 10K Ul	a160 S a320 S a160 S tra320	SCSI Hot-S CSI Hot-Sw SCSI Hot-S SCSI Hot-S	wap SL HDD* ap SL HDD* wap SL HDD* Swap SL HDD ansion Unit	06P5768 06P5776 06P5756



A control panel on top front of blade has following LEDs:

- Powergood
- Blade location
- Overtemperature
- Information
- · General fault

- Stealth black front bezel
   H 9.7" x W 1.14" x D 17.6";
   H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
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- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS40 blade server13

293.6GB\* with two 146.8GB SL SCSI disks

### **LIMITED WARRANTY**3

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response

  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response
  - (ServicePac part num 69P9525) 5 year IOR 24x7, 2 hr avg response
  - (ServicePac part num 69P9527) Other ServicePac options at http://www.ibm.com/
- services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

IBM <sup>®</sup> S		Switch module bays Switch mo std / max (ty	odule bays m	lanagement lodulebays r std/max		Power Module n Wattage	Blower nodulebays std / max	Mech- anical	Available date
8720-1RX 8832 I	HS20 / 8839 HS40 0 / 8	0 / 4 Ethernet, F	Fibre Channel	1/2	2 / 4	1300W	4/4 8	BU⁴ rack	Jul 2004
Positioning Description	Flexible, innovative designovides common resount expansion, external Fibrokeyboard, video, mouse	irces shared by blade e Channel storage swit	t protection and servers such as ching and conn	reduces de s power, sys ectivity, and	ployment cost stem manager I/O (combo C	ts for NEE ment, cab D/DVD d	<i>BS environi</i> ling, etherr lrive, and p	<i>ments</i> let manage orts for US	ment and B,
Blade bays	Supports HS20 (8832), I Blades / 8 hot-pluggable	ÁS40 (8839) blades wit	th Low Profile H cess	landle, SCSI	Storage Expa	ansion Un	its and PC	I I/O Expar	nsion
Switch modules Ethernet Switch Module	Std: none; max: four / ho Supports two 4-port GB HS20 blade server (two the HS20 dual integrated 3-4 with optional Etherne	Ethernet Switch Modulemodules to support both ethernet controllers /	es in bays 1 and th ethernet cont four external po lade server	d 2 / one Eth rollers on H rts / connect	nernet Switch S20 and for fa ts to std mgmt	Module re ilover red module /	equired for undancy) / GB etherr	ethernet su bays 1 and let supporte	pport on 1 2 wired to ed in bays
Fibre Channel Sw Mo	3-4 with optional Etherne vitch Supports two 2-port or 6 dule of two ports on optional and 4 wired to the HS20	<i>-port Fibre Channel Sw</i> Fibre Channel Expansi I/O expansion option o	<i>vitch Modules</i> in on Card (two m connector / two	bays 3 and odules to su external 2Gl	4 / one Fibre upport both po Bps small forn	Channel or rts and for tactor pl	Switch Mod r failover re uggable po	dule require edundancy) orts	d for one / bays 3
Management mod	dules Std: one; max: two / hot controller / communicate connectivity / controls ex ethernet remote manage	-swap / rear access (I/es with integrated syste ternal Telco alarm panement connection port	O ports) / comp m managemen el / ports: DB-1 / all ports share	prehensive so t processor of analog vide d by up to 8	ystem manago on each serve eo port, PS/2 3 blade servers	ement fur er blade / keyboard s / ports a	nctions / Po multiplexor I port, PS/2 Ill located o	werPC® 40 for consol 2 mouse po n rear of cl	)1 e ort, 10/100 hassis
Power modules	Std: two in bays 1 and 2 4-Lug Terminal Block / 1 modules, blade bays 1 - switch bays 3 & 4 and b	, <i>max:</i> four / hot-swap 300 watts / Two standa 4, and the media tray; lade bays 5 - 8 <i>All:</i> load	/ front access / ard modules (in two additional p d balancing/ vol	input voltago slots 1 & 2) power modul tage-sensing	es between -3 supply power les provide full g / auto-restart	8/-75 VDO to switch system r / no fans	C Min/Max bays 1 & 2 edundent p in power n	(-48 VDC i 2, both mar lower and p nodule(s)	nominal) / nagement power to
Blower modules	Std: four; max: four / hot air intake	-swap / redundant / vai	riable speed / re	ear access /	330 cubic ft p	er min (Cl	FM) / front	to back airf	low; filtered
Mechanical Optical / USB	EIA 19" rack models (8 24X-10X-24X-8X <sup>6</sup> Comb blade servers / requests	<b>BU</b> <sup>4</sup> ) x 20" deep / desig to / Two USB port (Ver for optical cd and USE	ned for EIA-310 sion 1.1) / all US 3 port(s) by pres	D and UTF SB interface ssing CD se	Four Post Ra (types A & C) lect button on	cks / front ac server bla	cess / sha ade front pa	red by up to anel	o eight
Keyboard / mouse Ports	e None standard / provide server blade front panel Rear: keyboard (PS/2), Telco Alarm Panel Front			-			-		
Security	Login password for remirecommended in rack e	ote connection / secure	socket layer (	SSL) securit	y for remote r	nanagem	ent access		
Ethernet Systems mgmt	One of the dual integrate Module (the second HS2 Provides remote console blowers, power modules	ed gigabit ethernet control 20/HS40 ethernet control and mamt / power or	trollers on each roller requires a	blade serve second opti- fules / monit	rs connects to onal <i>4-port Gl</i> tors power sta	an optior B <i>Etherne</i> tus, opera	nal <i>4-port C</i> et Switch M	GB Etherne odule) m, tempera	t Switch ture, disks,
System LED pane	el System LED panel provi	des power-on, location	, critical, major	and minor al	larm condition	S			
IBM BladeCenter IBM BladeCenter IBM Sleek 2-Butt		25l 25l 28l 930 90l	K8358   IBM E K8359   IBM E L3673   IBM E 0842S   IBM E P3775   IBM F P3774   IBM F IBM E IBM T • Othe	BladeCenter BladeCenter BladeCenter BladeCenter FAStT700 Fi FAStT200 S External USI 541 15" Fla er options a	Power Supply PCI I/O Expa 1GB Flash I 2GB Flash I 4GB Flash I ibre Channel torage Serve B Floppy Driv t Panel Colo at ibm.com/p ble from IBM	ansion Ur Disk Drive Disk Drive Storage r e Monitor oc/us/acc	Ait Server Server (black) essories		90P3742 90P3721 90P3771 90P3772 90P3773 17421RU 35421RU 05K9276 9512AB1 n partners
	Front	Dimensions: H13 7	'6"(8LI) x W17	4" x D20"/	front				

# Front 2 PB-4 PB-6 PB-7

Rear

Blower 2	switch-module 2 •	switch-module	Blower 1
Blower	KVM •	LAN •	Blower
•	switch-module 4 ●	switch-module 3 ●	3

Dimensions: H13.76"(8U) x W17.4" x D20"(front bezel to rear I/O); H349.5mm x W441.9mm x D508mm

Weight: 98 to 192 lb; 44.5 to 87.38kg

Stealth black color bezel

Tool-free customer serviceability

Access server blades, power supplies, mgmt modules, media tray and expansion units from front Access switch modules and blowers from rear Fits into Standard Central Office enviroments

Air Intake Filtering

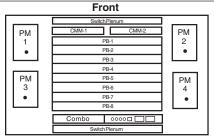
Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

Bay	Switch Function
1	Ethernet link 1 for all blade servers
2	Ethernet link 2 for all blade servers
3	Network connection 1 for all blade server
	I/O expansion options (Gb Ethernet/Fibre Channel)
4	Network connection 2 for all blade server I/O expansion options (Gb ethernet/Fibre Channel)

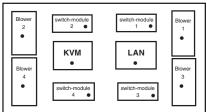
### **LIMITED WARRANTY**<sup>3</sup>

- ⇒ 3 year parts and labor
   ⇒ International Warranty Service³
   ⇒ On site, 8 am 5 pm, Mon Fri coverage excluding holidays, novt business day response times. next business day response time7
- On site service upgrade options (in
  - 3 year IOR 24x7, 2 hr avg response
     (ServicePac® part num 21P2065)
     3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
    5 year IOR 9x5, 4 hr avg response
  - (ServicePac part num 69P9207) 5 year IOR 24x7, 2 hr avg response
  - (ServicePac part num 69P9205)
  - Other ServicePac options at http://www.ibm.com/services/us/ its/pdf/wamomxeu.pdf
  - 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

		Blade Switch		Management	Power	Power Blow		
Type-model	blades sto	bays module bays Sv td / max std / max	vitch module bays (type)	s modulebays std / max	modulebays std / max	Module module Wattage std / n		Available date
8730-1RX 8832 H	IS20 / 8839 HS40	0/8 0/4 Ethe	rnet, Fibre Cha	annel 1/2	2/4	1300W 4/	4 8U <sup>4</sup> rack	Jul 2004
Positioning Description	Provides commo expansion, exterr video. mouse)	tive design provides inve on resources shared by mal Fibre Channel store	blade servers si age switching and	uch as power, sy d connectivity, an	/stem manage d I/O (combo	ment, cabling, e CD/DVD and po	thernet managerts for USB, ke	-
Blade bays	Supports HS20 (8 Expansion Blade	(8832), HS40 (8839) bla es / 8 hot-pluggable ser	ides with Low Prover bays / front a	ofile Handle, HS2 access	20, HS40 SCS	Storage Expans	sion Units and I	PCI I/O
Switch modules Ethernet Switch Module	Supports two 4-p HS20 blade serve the HS20 dual interest	four / hot-swap / rear a port GB Ethernet Switch ver (two modules to sup- ttegrated ethernet contri- expansion card on Serv- port or 6-port Fibre Chanel E pottonal Fibre Channel E	Modules in bays port both etherne	et controllers on F	HS20 and for to	ailover redundan t module / sunno	cy) / bays 1 an	d 2 wired to
Mod	ule of two ports on o and 4 wired to the	optional Fibre Channel Ene HS20 I/O expansion	Expansion Card ( option connector	two modules to start two external 20	support both po GBps small for	orts and for failor m factor pluggab	ver redundancy le ports	) / bays 3
Management mode	controller / comm connectivity / con	wo / hot-swap / rear ac municates with integrate ntrols external Telco ala management connectio	d system manág rm panel / ports:	gement processor DB-15 analog vi	r on each serv deo port, PS/2	er blade / multip keyboard port,	/ PowerPC® 4 lexor for conso PS/2 mouse p	01 le ort, 10/100
Power modules	Std: two in bays IEC320 C14 male management mo power to switch b	1 and 2 , <i>max:</i> four / ho le appliance connector / odules, blade bays 1 - 4 bays 3 & 4, and blade b	t-swap / Front ac 1300 watts / two and media tray; ays 5 - 8 <i>All</i> : loa	ccess / input volta o std modules (in Two addititional ad balancing / vol	age range 180\ slots 1 & 2) su power modules tage-sensing /	VAC - 264VAC Note: 10 pply power to some provide full system auto-restart / note: 10 pp. 10 p	Min/Max at 50/6 witch bays 1 & 2 tem redundent fans in power i	0Hz / two 2, both power and module(s)
Blower modules	Std: four; max: fo (CFM) / front to b	our / Calibrated Vectore back airflow; filtered air i	d Cooling / hot-sv ntake	wap / redundant /	variable spee	d / rear access /	330 cubic ft pe	r min
Mechanical Optical / USB	EIA 19" rack mo 24X-10X-24X-8X' blade servers / re	odels (8U <sup>4</sup> ) x 20" deep (6 Combo / Two USB portion of the co	/ designed for E ort (Version 1.1) / and USB port(s) I	IA-310D and UTI / all USB interfact by pressing CD s	F Four Post Ra e / front access select button o	acks s (types A & C) / n server blade fr	shared by up to	o eight
Keyboard / mouse Ports	server blade from Rear: keyboard	provides KVM console nt panel (PS/2), mouse (PS/2), nel <i>Front:</i> Two USB (Vel	analog DB-15 gra	sts for keyboard, aphics (on standa	mouse, and view ard mgmt mode	deo by pressing ule) / no serial o	the display but parallel ports /	ton on DB15
Security	Login password trecommended in	for remote connection in rack environment prov	secure socket la viding security the	ayer (SSL) secur rough lockable d	ity for remote oors or other s	management ac security measure	cess /	
Ethernet	Ethernet Switch I	integrated gigabit ethern Module (the second HS	net controllers on 320/HS40 etherne	each blade serv et controller requ	ers connects to	o an optional 4-port C	ort GB B Ethernet Sw	itch
Systems mgmt	Module) Provides remote blowers, power n	e console and mgmt / po modules / system diagr	ower on/off blade nostic programs p	es/modules / mor provided through	nitors power sta IBM Director s	atus, operating s software	ystem, tempera	ature, disks,
System LED panel	System LED pan	nel provides power-on, l	ocation, critical, r	major and minor	alarm conditior	าร		
IBM BladeCenter IBM BladeCenter IBM Sleek 2-Butto	lount Kit	landle landle	25K8358 25K8359 28L3673 930842S 90P3775 90P3774 37L6861	IBM 1300W AC IBM BladeCente IBM BladeCente IBM BladeCente IBM BladeCente IBM FAST700 I IBM FAST7200 I IBM FAST7200 I IBM FAST7200 I IBM T541 15" F Other options Solutions avail	er PCI I/O Exper 1GB Flash er 2GB Flash er 4GB Flash Fibre Channel Storage Serve BB Floppy Driv lat Panel Colo at ibm.com/	eansion Unit ' Disk Drive Disk Drive Disk Drive I Storage Serve er ve or Monitor (black pc/us/accessori	x) es	90P3743 90P3721 90P3771 90P3772 90P3773 17421RU 35421RU 05K9276 9512AB1 m partners



Rear



⇒ Dimensions: H13.76"(8U) x W17.4" x D20"(front bezel to rear I/O); H349.5mm x W441.9mm x D508mm

Weight: 98 to 192 lb; 44.5 to 87.38kg

Stealth black color bezel

Tool-free customer serviceability

- Access server blades, power supplies, mgmt modules, media tray and expansion units from front
- Access switch modules and blowers from rear
- Fits into Standard Central Office environments

Air Intake Filtering

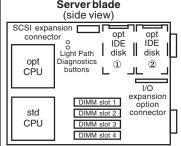
→ All Intake Fillering
 → Predictive Failure Analysis® alerts blade server memory, processor(s), and optional disk(s) with IBM Director

Bay Switch function	
1 Ethernet link 1 for all bla 2 Ethernet link 2 for all bla 3 Network connection 1 for I/O expansion options ( Network connection 2 for I/O expansion options (	ade servers or all blade server (Gb Ethernet/Fibre) or all blade server

### **LIMITED WARRANTY**<sup>3</sup>

- ⇒ 3 year parts and labor
   ⇒ International Warranty Service³
   ⇒ On site, 8 am 5 pm, Mon Fri coverage excluding holidays, novt business day response times. next business day response time7
- On site service upgrade options (in
  - 3 year IOR 24x7, 2 hr avg response
     (ServicePac® part num 21P2065)
     3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 30L9185) 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
  - 5 year IOR 9x5, 4 hr avg response
  - (ServicePac part num 69P9207) 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9205)
  - Other ServicePac options at http://www.ibm.com/services/us/ its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

IBM <sup>®</sup> Type-model Qty x Pro		Bus Mhz C			-	SCSI supportional store	exp unit x	bays		Required chassis	Available date
8832-GTX 1 x Xeor 8832-9TX 1 x Xeor		533Mhz 2 533Mhz 2				2 HS Ultra32 2 HS Ultra32				e BladeCenter T e BladeCenter T	
Positioning Processor(s) L2/L3 Cache SMP support Implementation	Ultra-dense, highly 1 x Intel® Xeon 2. 512KB L2 Cache / 2-way SMP / up to Server blade conta one SCSI expansio	5 HGz or 3. 0 - 2MB L3  two Xeon ins two Intel	2GHz with Cache / c Processor 604-pin mid	533MHz on die of p s (same s cro-PGA Z	frontside processo speed/ca IF socke	bus / Hyper r / at process che size) ets, four memo	-Threadin sor speed ory DIMM	ng tecl d I slots	hnology / , two IDE o	connectors,	tecture
Memory	1GB std / 8GB ma PC2100 266MHz re must be installed in Error Checking ar detects 2- through 8	egistered 184 matched pa ad Correctin	4-pin ECC I iirs [a bank] <b>ıg (ECC)</b> vi	DDR-SDR  /2-way m a <b>16-bit C</b>	AM DIM nemory ir <b>hecksur</b>	Ms / four DIM nterleave / dua	al channe	el / me	mory bus	runs at 2 x 100M	1Hz/
IDE controller/bays SCSI disk controller	Enhanced IDE AT IDE disk / no cable disks / space for connector via one connector CIOB-ES I/O Bridg 3.5" one-inch high	e as IDE dis only one IDE optional SC / LSI Logic <sup>©</sup> ge (IMB2 bu	sk attaches E disk if an CSI Storag 53C1020 Is to Host	to riser of I/O expande Expande Ultra320 Bridge) / s	card and nation op sion Un SCSI cosumer suggested to the second suggested to the suggested	tray (include otion installed it (a blade of ontroller [LVE a RAID-1 mi	ed with o d [Fibre C ccupying D 320MB/ irroring [	ption Chann adjad /sec] [Embe	kit) / Sup lel] / <b>RAII</b> cent blade / 64-bit 13 edded Mir	ports max of tw D-1 mirroring s e slot / connects 33MHz PCI-X B roring] with two	o IDE tandard s to HS20 us B from hot-swap
SCSI disk bays External storage	Supports max of tw 80-pin SCA-2 conn Support for IBM To	o hot-swap ectors / <b>all S</b>	3.5" SL Ult SCSI bays	ra320 SC: <b>Ultra320-</b>	SI disks <b>enabled</b>	in optional S0 I	CSI Stora	ige Ex			
Mechanical Architecture / chipsets Bus slots	Supported in IBM B ServerWorks® Grone CIOBE-S I/O ethernet and the I/LPC bus to Super No PCI or PCI-X s	<b>and Champ</b> Bridge (IMB 'O expansio I/O, and PC	oion™ 4.0 2 bus to H n option co Cl 2.2 Bus	LE / CMIC lost Bridge onnector / C with gra	C LE Ho e) for tw CSB6-l aphics c	est Bridge (m o PCI-X Bus J South Brido ontroller / Na	emory co es with E ge (Thin ational Se	ontroll Bus A IMB t emico	ler and I/0 for etherr o Host Br nductor® I	D Bridge) / sing net and Bus B f idge) for EIDE,	le slot or USB,
Ethernet controllers  Network-interface  CD / diskette / USB Kybd / video / mouse Graphics	/ Alert Standard Form switch or Optical F One connector for 3 and 4 of BladeCo card) / ethernet an None / requests for	mat 1.0 / tear Passthrough or I/O expan enter / all blad d serial I/O CD-ROM, d keyboard, m	ming and fai Module (the sion option	lover supp ne second on (Fibre ingle Blad cards pla e, and US video in Bl	ort / one controll Channel leCenter nned for B port in ladeCen	of the dual co er requires a Expansion ( must contain future releas BladeCenter ter by pressin	ntrollers of second Card) / rent the same second by pressing the disp	connection option optio	ets to an opmal switch is same in cansion can	otional, supported or OPM) aterface modules ard (or no expan atton on front con	d Ethernet s in bays sion atrol panel
Systems mgmt  Diagnostics	IBM integrated sy H8S2148 / on bladd monitoring, event r for communication Light Path Diagno component) and or	e / provides s ecording, ale with BladeC estics™ (LEI	system and ert capabilit enter mana D lights indi	l environm ly / RS-48! lgement m cate failin	nental 5 interfac nodule 9	Proc Up 512MB I 1GB PC 2GB PC	og PC2100 ( 2100 CL2 2100 CL2	CL2.5 2.5 EC 2.5 EC	C DDR-S	.3 Cache -SDRAM DIMM DRAM RDIMM DRAM RDIMM sion Unit (blade	13N0650 33L5038 33L5039 33L5040
Security Software ship group	Power-on passwor unattended boot / s Documentation CD	electable bo	ot / unatter	nded start		IBM HS ports;	20 Fibre ; each po	Chan rt requ	nel Expan uires a FC	sion Onlt (blade sion Card (with t Switch Module A-100 HDD	two
Cooling fans  Power supply Prerequisites	Uses cooling from sensors on each p front panel Uses power modu Monitor, keyboard	BladeCente processor and le(s) in Blad , mouse for	er (type 87 nd BladeC deCenter ( setup; eth	20/30) / t enter mod type 8677 ernet swi	hermal dules an	36.4GB 36.4GB 73.4GB 146.8GI	15K Ultra 15K Ultra 10K Ultra 10K Ult	a160 a320 S a160 tra320	SCSI Hot- SCSI Hot-S SCSI Hot- I SCSI Ho	Swap SL HDD* Swap SL HDD* Swap SL HDD* t-Swap SL HDD* t-Swap SL HDD xpansion Unit	06P5768 06P5776 06P5756
	lade E	ay ① 3.5", 9	.5mm, no fr	ont access	s, option	 al ThinkPad®	IDE disk	<b>⇒</b> 3	year parts	ED WARRANT s and labor	
	Server blade  Bay ① 3.5", 9.5mm, no front access, optional ThinkPad ® IDE disk  (side view)  Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk  International Warranty Service  International Warranty Service										



- Powergood
- Blade location
- Overtemperature
- Information
- · General fault

Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk

- Stealth black front bezel
- ⇒ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS20 blade server13: 80GB with two 40GB EIDÉ disks or 293.6GB\* with two 146.8GB SL SCSI disks

- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response
  - (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response
  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support forwarranty issues during the warranty period3

IBM®		L2 FSB		Disk		SCSISupp	ort with	slots	Mech-		Available
Type-GAV Processor				Disk controller					anical	Ethernet	date
8843-L1y 1 x Xeon <sup>T</sup> 8843-4Ty 1 x Xeon	3.6GHz	1MB 800 1MB 800	1GB N	lone Ultra320 Ione Ultra320	2-fixed 2-fixed	2 Hot-swap 2 Hot-swap	Ultra320	0 x 2 0 x 2	7U⁴ blade 7U⁴ blade	2 x Gigabit 2 x Gigabit	Feb 2005 Feb 2005
Processor(s)	1 x Intel® Xeor	n 2.8 Low \	/oltage or	3.6 GHz with 8	BOOMHz fr	ontside bus	(FSB) / EI	<b>//64T</b> / 1	IMB L2 EC	C Cache / Hy	per-
SMP - L2 Cache Implementation	Threading technology / Low Voltage Processors reduce heat output for increased rack density without increased cooling capacit 2-way SMP / up to two Xeon Processors (same speed/cache size) / 1MB std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet										
Memory	512MB/1GB st PC2-3200 400l installed in mat	MHz CL2.5	ECC DDR2	2-SDRAM DIM	Ms / four 2	240 pin gold-c	connector s	slots on	systemboar	d / DIMMs mu	ust be
SCSI disk controller	LSI Logic® 530 PCI-X / suppor	C1020 SCS ts RAID-1 8	controller /	Single chanring (supported	in 32-bit l	20 SCSI contracts and segacy mode of	roller (LVE only) / One	320ME 16-bit	B/sec) / on p channel (on	olanar / 64-bit e internal) / <i>In</i>	100MHz ternal
SCSI Disk bays	PCI-X / supports RAID-1 & 1E mirroring (supported in 32-bit legacy mode only) / One 16-bit channel (one internal) / Internal channel: one 2-drop 16-bit 68-pin LVD SCSI cable  Two 2.5-inch Small Form Factor (SFF) Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; all SCSI bays Ultra320-enabled) /								320 SCSI		
External Storage	Support for IBN	M TotalStora	age Expans ige™ solutio	ons (including F	AStT and	NAS family o	f products)	/S Ullia	320-eriable	u) /	
Mechanical Architecture/Chipset	7U Blade / Sup Intel E7520 ch BUS / ICH5R s	pported in IB nipset / E75 supports US	M BladeCe 25 MCH (M B (1.0) / LS	nter 8677-3XX lemory Control I 1020 / Dual E	or 8677-1 ler Hub) fo roadcom !	XX/2XX (requor PCI-Express 5704S / Low F	ires upgra s bridge to Pin Count I	de to 20 PXH, 10 nterface	00W power CH5R / PXH / NS PC87	supply option I BUS suppor 366 Super I/O	26K4816) ts PCI-X off LPC
BUS slots	interface No PCI or PCI	-X slots (exp	pansion via	modules or ne	etwork-inte	rface option c	onnector)				
Ethernet  Network Interface	Dual gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM) One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet										
CD / Diskette / USB Kybd / video / mouse Graphics controller	and serial I/O expansion cards planned for future release <sup>20</sup> None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel  None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel  SVGA / ATI® Radeon <sup>TM</sup> 7000M on Planar / 16MB SDRAM std and max / 15 pin connector										
Systems Mgmt	IBM Baseboar recording, alert intermanagement	capability / ent commur	RS-485 inte	erface`for '	H8S2168 /	on blade / p	rovides sys	stem an	d environme	ental monitorin	ig, event
Diagnostics	Management n Light Path Dia component) an BIOS)	nodule <b>agnostics</b> ™ nd on-board	(LED lights diagnostics	s indicate failing (via PC-Docto	g or in	Xeon 2.8 GI Xeon 3.6 GI 512MB (2x2	Hz/800/1M 256) PC2-3	B L2 Ca 200 EC	ache EM647 C DDR2		13N0699 13N0659 73P3522
Security	No security intradministrator pa				\ b		3) PC2-32(	OO ECC	DDR2 Chip	K RDIMM Kit	
Software ship group	selectable boot Documentation	t / unattende	ed start mod	de		4GB (2x2GI   IBM 36.4GE   IBM 73GB 1	i 10K Ultra	320 SC	SI 2.5"SFF <sup>*</sup>		73P2867 90P1312 90P1313
Cooling Fans	Uses cooling fr	rom BladeC	enter (type	8677) / therma	l sensors	BladeCenter BladeCenter	r SCSI Sto	rage Ex	p Unit		26K4817 26K4841
Power supply(s) Prerequisites	on each proces Uses power m Monitor, keybo disk, BladeCen	odule(s) in I ard, mouse	BladeCente for setup; e	r (type 8677) ethernet switch	•	BladeCenter BladeCenter BladeCenter 17-inch Flat Other option	r SFF Giga r Optical P r SCSI Sto Panel Mor	abit Ether ass-thrungen rage Expander and the Ether	ernet Exp Ca I Module pansion Uni nsole Kit w/	ard it US Kybd	26K4842 02R9080 26K4817 17231UX

Bay @ 3.5",9.5mm, no front access, optional 2.5-inch SFF SCSI disk Bay @ 3.5",9.5mm, no front access, optional 2.5-inch SFF SCSI disk

#### Server blade (side view) SCSI expansion \_\_\_\_\_ opt opt SFF SFF SFF SFF Light Path L JL <sup>②</sup> Diagnostics opt CPU buttons I/O expansion DIMM slot 1 option std DIMM slot 2 connector CPU DIMM slot 3 DIMM slot 4

A control panel on top front of blade has following LEDs:

- Power good
- Blade location
- Over temperature
- Information

information

· General fault

- Stealth black front bezel
- ⇒ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm

- H 24.5cm x W 2.9cm x D 44.5cm

  12 lbs; 5.4kg (max configuration)

  Configuration/Setup Utility:F1 at startup

  Diagnostics (PC-Doctor™): F2 at startup

  System Partition Boot: ALT+F1 at startup

  Network Boot: F12 at startup

  PXE Boot Agent Utility: Ctrl+S at startup

  Riede control panel on each HS20 blade:

- ➡ Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s). and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS20 blade server<sup>13</sup>: 146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 146GB for total of 438GB)

### **LIMITED WARRANTY**<sup>3</sup>

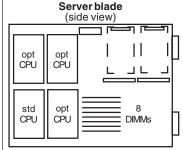
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade
- options (in eligible locations):<sup>7</sup>
   4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
- 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521) 4 year IOR 24x7, 4 hr avg response
- (ServicePac part num 69P9522)

   4 year IOR 24x7, 2 hr avg response
  (ServicePac part num 69P9523)

  → Other ServicePac options at
- http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty

IBM® Type-model Qty x Pro	<u> </u>		Disk Disk controller	bays (	SCSI support with optional exp. unit	Slots x bays		Required chassis	Available date	
8839-6TX 1 x Xeon™ 2.8GHz MP 2MB 2GB 400Mhz None None None 2 H-S Ultra320 0x2 8U⁴ blade BladeCenter T Mar 2004										
Positioning Processor(s) L2/L3 cache SMP support Implementation	512KB L2 Cache / 2MB L3 Cache / on die of processor / at processor speed t 4-way SMP / up to four Xeon MP Processors (same speed/cache size)									
Memory	<b>2GB</b> std / 16GB max <sup>13</sup> / two slots used / six slots available / eight total slots <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill</b> <sup>TM</sup> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed									
	None / supports option via one connector / LSI I CIOB-ES I/O Bridge (IMB 3.5" one-inch high SL SO	.ogic® 530 32 bus to CSI disks i	1020 Ultra320 Host Bridge) / n front bays / c	SCSI consupports one 16-bit is	troller [LVD 320] <b>RAID-1 mirrorir</b> internal channel	MB/sec] I <b>g</b> [Emb / no ca	/ 64-bit 1: edded Mir bles or ext	33MHz PCI-X I roring] with two ernal connectors	Bus B from o hot-swap	
SCSI disk bays  External storage	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / all SCSI bays Ultra320-enabled Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)									
Mechanical	Supported in IBM BladeCe	nter (type 8	B677) / BladeCe	nter suppor	ted in 28" deep ra	cks suc	h as the IBI		ck products	
ServerWorks® Grand Champion™ 4.0 LE / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / Architecture / chipsets one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip Bus slots  No PCI or PCI-X slots (expansion via modules or network-interface option connector)										
Ethernet controllers	Four gigabit 10/100/1000 et	hernet cont	rollers / Intel 825	545GM/8254	46EB / on blade /	two PCI	-X 64-bit 10			
Network-interface	Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional 4-port GB Ethernet Switch Module (the second controller requires a second optional Ethernet Switch Module)  Two connectors for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release <sup>20</sup>									
CD / diskette / USB Kybd / video / mouse Graphics	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	Intel integrated Basebo / on blade / provides sys event recording, alert ca	tem and e pability / F	nvironmental n IS-485 interfac	nonitoring, e for	512MB PC210 1GB PC2100 (	0 CL2.5 CL2.5 E	ECC DDR CC DDR-S	-SDRAM DIMM DRAM RDIMM	13N0653 33L5038 33L5039	
Diagnostics	communication with Blad Light Path Diagnostics component) and on-board	™ (LED lig	hts indicate fai	ling					th two	
Security	Power-on password / ad				ports; each port requires a FC Switch Module) 48P70 IBM HS40 40GB <sup>2</sup> 5400 rpm ATA-100 HDD 48P70					
Software ship group		of / selectable boot / unattended start mode CD, IBM Director 4.1 CD, Device Driver CD 36.4GB 15K Ultra160 SCSI Hot-Swap SL HDI 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDI						wap SL HDD*	06P5776	
Cooling fans	Uses cooling from BladeO							Swap SL HDD* -Swap SL HDD		
Power supply Prerequisites	on each processor and BladeCenter modules and front panel Uses power module(s) in BladeCenter (type 8677)  Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system									



- Powergood
- Blade location
- Overtemperature
- Information
- General fault

- Stealth black front bezel
   H 9.7" x W 1.14" x D 17.6";
   H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
   Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup Blade control panel on each HS40 blade server provides
- media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS40 blade server13: 293.6GB\* with two 146.8GB SL SCSI disks

### **LIMITED WARRANTY**3

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am 5 pm, Mon Fri coverage excluding holidays,
- next business day response time<sup>7</sup> On site service upgrade options (in eligible locations):
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519) 3 year IOR 24x7, 4 hr avg response

  - (ServicePac part num 69P9518)

    3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response
  - (ServicePac part num 69P9525) 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
- Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

Warranty information: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC, 27709, Attn: Dept JDJA/B203. IBM makes no representation or warranty regarding third party products or services.

- MHz/GHz only measures microprocessor internal clock speed; many factors affect application perfomance.
- MB/GB/TB = 1 million/billion/trillion bytes when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition.
- For terms and conditions or a copy of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the U.S. Copies available upon request. Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. International Warranty Service is available in any country in which this product is sold and serviced. Service delivery methods and parts availability vary by country, may be different from that in the country of purchase, and are subject to change without notice. Fees and restrictions may apply in some countries.
- <sup>4</sup> A single "U", or rack unit, is 1.75" or 44.45mm.
- 5 S.M.A.R.T. stands for Self-Monitoring, Analysis and Reporting Technology.
- <sup>6</sup> CD and DVD drives speeds are variable and are often less than the maximum.
- These services are available for machines normally used for business, professional, or trade purposes, rather than personal, family or household purposes. Not all machiné types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For non-critical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives, and channel controllers, require their own, separate service coverage, they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. Not available in all states; call your IBM representative for details.

- 8 Subject to conditions.
- <sup>9</sup> Some software may differ from retail version (if any) and may not include user manuals or all program functionality. Software license agreements may apply.
- <sup>10</sup> Updated drivers and hot-swap services for certain operating systems may be required to support PCI hot-swap functions.
- <sup>11</sup> Fire GL1, Fire GL2 and Fire GL4 are trademarks of ATI Technologies, Inc., and are used under license.
- <sup>12</sup> Installation of 2GB RDIMMs requires BIOS and diagnostic firmware version 1.08 or later. When more than 8GB of memory is installed, the integrated SCSI controller must be disabled.
- Maximum memory and internal hard disk capacities may require the replacement of standard component with largest supported component available.
- <sup>14</sup> Response times may vary. May exclude some holidays. Telephone support may be subject to additional charges.
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- Y Some software may differ from its retail version (if available), and may not include user manual or all program functionality. Software license agreements may apply.
- Diskettes and hard copy documentation available at extra charge.
- For combination drives, maximum possible speeds only are given in the following order: CD read, CD write, CD re-write, DVD read
- Statement of direction and subject to availability.
- Max physical memory is currently 16GB contingent on general availability of 4GB memory DIMMS, running under select 64-bit Linux distributions; addressable capacity is less. Under select 32-bit Linux distributions, maximum physical memory is 16GB contingent on general availability of 4GB memory modules, with a maximum of 3GB allocated per thread. Maximum physical memory is 4GB running under Microsoft Windows XP Professional operating system; addressable capacity is less.
- 22 16GB Memory max with PC2700 DIMMs, 8GB Max with PC3200 DIMMs



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