# IBM @server xSeries Education



## xSeries Reference (xREF)

including
IBM @server™
IntelliStation™ / xSeries™ / BladeCenter™

March 25, 2003





	# III(eIII) Station   E PTO (0210)															
IBM® Type-mod	el Processo	L2 r GHz¹ cach	FSB e MHz		Disk an	d rpm	SCSI adapte	r CD-ROM	Gra	aphics adapter	and m	nemory	Slots :		oad <sup>17</sup>	Availabl dat
6216-22U 6216-23U ← 6216-30U ← 6216-32U 6216-40U	J Pentium 4 J Pentium 4 J Pentium 4 J Pentium 4 J Pentium 4		(B 400 (B 400 (B 533 (B 533 (B 533	256MB 256MB 256MB 256MB 256MB	18.2GE 40GB 40GB 40GB	7200	None 29160L None None None	CD-ROM PCD-ROM CD-ROM CD-ROM CD-ROM	NV NV Mil NV Mil	lennium G450 /IDIA™ Quadro /IDIA Quadro4 lennium G450 /IDIA Quadro4 lennium G450 /IDIA Quadro4	04 6   64N   DVI-   64N   DVI-	4MB MB -I 32M MB -I 32M	4x3 4x3 B4x3 4x3 B4x3	Window Window Window Window Window	ws XP Pro ws XP Pro ws XP Pro ws XP Pro	Aug ( Aug ( Aug ( Aug ( Aug (
Positionin Processo L2 cache Implemen SMP supp	ration	Essential w Intel® Pent with 400 or 512KB std Processor a No SMP su	um 4 a 533M and ma and L2	nt 2.0, 2.20 Hz frontsi nx / ECC /	<b>6, or 2.40</b> <b>de bus</b> ( full spee	(FSB) d	GA478	socket		Low-profile	SL	1", ;	disk	L s, sto	CD-ROM disk	
Memory - Memory - Memory -	std/max sockets	256MB / 20 Two 184-pi PC2100 26 Correcting industry std	BB <sup>13</sup> m n gold SMHz I (ECC)	plated DI DDR-SDR DIMMs a	AM / Err	or Che	cking a	and		Bay ② 5.25", Bay ③ 3.5", Slot 1: low-p Slot 2: low-p Slot 3: low-p Slot 4: low-p	SL profile profile profile	1", , 32-bi , 32-bi , 32-bi	no acc t AGP t PCI 2 t PCI 2	ess, sto 4X (1.5 .2 (5v) .2 (5v)	v) - used	
Graphics (one of	• Matrox® Millennium G450 DVI-I (high-perf 2D) / AGP 4X adapter / MGA G450F GPU / 32MB 150MHz DDR-SDRAM / dual RAMDAC [360/232MHz] / dual head support / one DVI-I connector (ships with one cable with two DB-15 analog conns) • NVIDIA Quadro4 200NVS (high-perf 2D) / AGP 4X adapter / NV17LT 250MHz GPU / 64MB 166MHz SDRAM / dual 350MHz RAMDACs / dual head: 2048x1536x16M each monitor / LFH60 connector for std cable with two DB-15 analog  SCSI disk controller  • Matrox® Millennium G450 DVI-I (high-perf 2D) / AGP 4X adapter / 14.2" W X 16.2"D X 4.1"H  • Stealth black color • 14.2" W X 16.2"D X 4.1"H  • 360mm W X 412mm D X 10.00 • Bays 1 and 2/3 flip up (late 10.00) • Toolless rails for disk mountain to rolless cover removal • Toolless AGP and PCI slc • Support for 100 lb monitor								"H X 104 0.0 kg) latched nountin	mm H ) d and pi	,	-,				
SCSI disk SCSI con Disk contr Cables	nectors	Ultra160 So (in a 32-bit s SCSI mode Enhanced I SCSI mode	CSI (L\ slot) / o ls: One DE / A l: One ls: Two	/D 160MB ne channo e 68-pin in ΓΑ-100 / ir e 1-drop 1 o EIDE 80	/sec) / 64 el with up ternal SC ntegrated 6-bit LVE conduct	4-bit 33 to 15 con d in I/O SCSI or cabl	MHz Podevice someotor / Controllicable, c	CI adapter support one 0.8mm ler Hub / two	con DE	Support for  DCI 68-pin extra nectors on pla 80-conductor	ernal	b mon	itor on connec	tor	•	
Disk			l: 18.2		160 SCS	SI / 100				S.M.A.R.T. <sup>5</sup> c / S.M.A.R.T.					rt via knoc	cout
Diskette Rack supp Chipset		3.5" 1.44M None Intel 845E ( 82801DB I/ ethernet M/	diske chipse Cont C, US	ette drive t / 82845E roller Hub B, Low Pi	e / 48X-20X <sup>6</sup> CD-ROM, bootable 5E Memory Controller Hub (MCH) / ub (ICH4) for PCI 2.2 bus, ATA-100 EIDE, Pin Count Interface / Firmware Hub / er I/O for diskette, parallel, serial, keyboard, r				,	<ul> <li>Cover key lock (on rear)</li> <li>Cover tamper detect switch</li> <li>Secure fixed DASD</li> <li>Power-on password</li> <li>Administrator password</li> <li>Boot sequence control</li> <li>Boot without keyboard or mouse</li> <li>Diskette boot inhibit and write-protect</li> </ul>						
Ports  Audio  Audio con Speakers		ethe Integrated of (done by pr (analog mix	P-pin sernet, met, met, met, met, met, met, met, m	erial, paral onitor udio / Sou or and ICH alog-to-Di e-in (mond	allel, two USB (Ver 2.0), keyboard, mouse, undMAX® 3.0 with SPX™ / software-based au H4) / AC '97 interface / Realtec®ALC202 code bigital and Digital-to-Analog conversion) io), line-in (stereo), line-out (stereo) [all 3.5m					ed audio codec/	Diskette, disk, serial port, paralle I/O control     Secure access openings     Secure removable media     VPD stored in EEPROM     Write protection control for FEP			ort, paralle ngs dia DM ol for EEPF	l port	
Ethernet Security o	chip	10/100/100 full duplex / None	0 ģigak PHY a	oit / Broado nd MAC la	com® BC ayers / W	M 5702 /ake or	ı LAN® /	Alert Standa		2-bit 33MHz/ Format 1.0	- 80 - M	OGB <sup>13</sup> Iaximu	(1 disk	x 80G rnal SC	DE disk ca BB 7200 rp CSI disk ca B.4GB 100	m) apacity:
Keyboard Cooling fa Power su	ans	104-key (ru Two or thre 160 watts w	e varia	ble speed	fans (po	wer spl	v, fansi	nk, SCSI mo	del I	has third fan)	~ .				RRANTY <sup>3</sup>	
Microso: - Lotus - Lotus - Disk-t - Devic  - Confir press - Produ startu - Syste - Rema IBM E - Syste - Comr - PC 20 - Advar - Advar - Powe	Preload with Windows XP Professional Microsoft® Windows® XP Professional - Lotus® SmartSuite® Millennium license - Disk-to-Disk Recovery (in Service Partitio Device Drivers and Diagnostics CD-ROM  Configuration/Setup Utility invoked by pressing F1 at startup Product Recovery by pressing F11 at startup Systems management capabilities: Remote Deployment Manager, IBM Director Agent, System Migration Assistant Common Information Model (CIM) 2.2 PC 2001-compliant Advanced Power Management 1.2 Advanced Configuration and Power Interface (ACPI) 1.0b					C2100 2100 Cl E Disk , E Disk , E Disk , 160 SC 10K rpn 10K rpn 40X M; 440X/16 0 drive 0-RAM/ 19" (18 5 21" (15 5 15.1" 0 17" Fl leless ke	CL2.5 L2.5 EC ATA-10 ATA-10 CSI Ada n Ultra1 n Ultra1 ax <sup>6</sup> CD- SX Max (black) DVD-R 3.0" v.i.s 19.8" v.i.s 19.8" v.i.s 19.8" v.i.s	ECC DDR U CC DDR UDI O (7200 rpm O (7200 rpm O (7200 rpm O (7200 rpm O (7200 rpm O (7200 rpm 60 SCSI Dis 60 SCSI Dis RW internal 6.19 CD-RW/ Drive (black s.) Monitor (bl. s.s.) Monitor (bl. Monitor (bl. and mouse	DIMMM ) ) ) k k (blactor) blactor ack (blactor)	10K0071 22P7157 09N4207 09N4226 19K4646 06P5751 06P5752 ack)22P6976 D-ROM 22P6973 22P6959 k) 6551U3N ck) 6653U3N ck) 6653HG2 06657HG2 1ck)22P5170 33L3252		onterna On site covera next bu On site eligible 3yr lo respo 4yr lo 4yr lo respo 4yr lo respo 4yr lo	attional att	i - 5 pm cluding s day rece upgi ions):? n-Fri 8- Service ay x 24 Service n-Fri 8- se (Ser n-Fri 8- Service ay x 24 Service ee sup	nty Service, Mon - Findolidays, esponse terade option -5, 4 hr average 41L27 hr, 4 hr average 45, 4 hr average 69P91 hr, 4 hr average 69P91 poort for varranty person - Findolidae - Findol	ime ns (in erage 735) verage 41) ssiness PP9167 erage 68) verage 69) varrant

IBM® Type-model Processo	L2 FSB or GHz¹ cache MHz Memo	· · · · · · · · · · · · · · · · · · ·			and memory	
6216-54U Pentium 4	4 2.67 512KB 533 256N	IB 40GB 7200	None CD-ROM ONOne CD-ROM	Quadro®4 200N Quadro4 580X	VS 64MB GL 64MB	34x3         Windows® XP Pro         Nov02           4x3         Windows XP Pro         Nov02           4x3         Windows XP Pro         Nov02           4x3         Windows XP Pro         Nov02
Positioning Processor L2 cache	Essential workstation pen Intel® Pentium 4 at 2.670 with 533MHz frontside b 512KB std and max / EC	äHz us (FSB)		Low-profile	Desktop	diskette CD-ROM disk
Implementation SMP support	Processor and L2 cache i No SMP support	n FC-PGA2 in mF	PGA478 socket		', HH 1.6", a	
Memory - std/max Memory - sockets Memory - type	256MB / 2GB <sup>13</sup> max Two 184-pin gold-plated I PC2100 266MHz DDR-S Correcting (ECC) DIMM industry std / unbuffered /	DRAM / Error Ch and ECC memo	ecking and ory controller /	Slot 1: low- Slot 2: low- Slot 3: low-	profile, 32-bit profile, 32-bit profile, 32-bit	no access, std disk t AGP 4X (1.5v) - used t PCI 2.2 (5v) t PCI 2.2 (5v) t PCI 2.2 (5v)- SCSI (some)
Graphics controller (one of following)	Matrox® Millennium Gradapter / MGA G450F (dual RAMDAC [360/23z connector (ships with on NVIDIA® Quadro4 200l NV17LT 250MHz GPU dual 350MHz RAMDAC monitor / LFH60 connec      NVIDIA Quadro4 580X NV18GL 300MHz RAMDAC LFH60 connector includes the second second connector includes the second connector inc	GPU / 32MB 150M MHz] / dual head le cable with two lVS (high-perf 2E 64MB 166MHz S s / dual head: 204 tor for std cable w GL (entry 3D) / A / 64MB 275MHz s / dual head: 20	MHz DDR-SDRAM / support / one DVI-I DB-15 analog conns b) / AGP 4X adapter SDRAM / l8x1536x16M each with two DB-15 analo AGP 8X adapter / DDR-SDRAM / 48x1536x16M each	9 360mm W 20.0 to 22. Bays 1 and Toolless ra Toolless A Support fo	16.2"D X 4.1 X 412mm D 0 lb (9.1 to 10	X 104mm H 0.0 kg) atched and pivoting) jounting slots
SCSI disk controller				a160 SCSI (LVD 1	60MB/sec) /	64-bit 33MHz PCI adapter
SCSI connectors Disk controller Cables	(in a 32-bit slot) / one cha SCSI model: One 68-pir Enhanced IDE / ATA-100 SCSI model: One 1-drop EIDE models: Two EIDE	internal SCSI co / integrated in I/C o 16-bit LVD SCS 30-conductor cab	nnector / one 0.8mm Controller Hub / two I cable, one 1-drop E	connectors on plants	anar	ected to CD-ROM)
Disk	one 1-drop SCSI model: 18.2GB UI EIDE models: 40GB EIDI					SECURITY U-bolt support via knockout y lock (on rear)
Diskette / CD-ROM Rack support Chipset	3.5" 1.44MB diskette driv None Intel 845E chipset / 8284 82801DB I/O Controller F ethernet MAC, USB, Low SMSC® LPC47M102 Sup	re / 48X-20X <sup>6</sup> CE 5E Memory Cont ub (ICH4) for PCI Pin Count Interfa	D-ROM, bootable roller Hub (MCH) / I 2.2 bus, ATA-100 E ce / Firmware Hub /	IDE,	Cover ta Secure f Power-o Administ Boot seq Boot with	mper detect switch ixed DASD n password trator password quence control nout keyboard or mouse boot inhibit and write-protect
Ports	Front: two USB (Ver 2.0) Back: two 9-pin serial, pa	rallel, two USB (V	/er 2.0), keyboard, n	nouse,	Diskette I/O contr	, disk, serial port, parallel port ol
Audio connectors	ethernet, monitor Integrated digital audio / S (done by processor and lo (analog mixing, Analog-to Back: microphone-in (m	CH4) / AC '97 inte -Digital and Digita ono), line-in (stere	erface / Realtec®ALC II-to-Analog conversi	202 codec / on)	<ul><li>Secure re</li><li>VPD store</li><li>Write pro</li></ul>	access openings emovable media red in EEPROM otection control for EEPROM labels on most components
Speakers Ethernet Security chip	One internal speaker for b 10/100/1000 gigabit / Bro full duplex / PHY and MAI None	adcom® BCM 570			80GB <sup>13</sup> (  • Maximur	m internal EIDE disk capacity: (1 disk x 80GB 7200 rpm) m internal SCSI disk capacity:
Keyboard / mouse Cooling fans Power supply	104-key (rubber dome) ke Two or three variable spe 160 watts with variable sp	éd fans (power sp	oly, fansink, SCSI mo	odel has third fan)		(1 disk x 73.4GB 10000 rpm)
Microsoft® Windows - Lotus® SmartSuit - Lotus Notes® Clie - Disk-to-Disk Rec - Device Drivers a  • Configuration/Se - pressing F1 at st - Product Recove - startup - Systems manage - Remote Deploym - IBM Director Age - System Migration	te® Millennium license ent license sovery (in Service Partition nd Diagnostics CD-ROM etup Utility invoked by eartup ry by pressing F11 at ement capabilities: enent Manager, ent, n Assistant ation Model (CIM) 2.2 ant r Management 1.2 juration and (ACPI) 1.0b	256MB PC2100 512MB PC2100 1GB PC2100 C 40GB IDE Disk 60GB IDE Disk 80GB IDE Disk PCI Ultra160 S 36.4GB 10K rp 73.4GB 10K rp 40X/12X/40X M 32X/10X/40X/1 Combo drive IBM DVD-RAM IBM P97 19" (1 IBM P275 21" (IBM T545 15.1' IBM T750 17" F IBM Wireless k Spaceball 3D Ir	m Ultra160 SCSI Dim Ultra160 SCSI Dim Ultra160 SCSI Di Max <sup>6</sup> CD-RW interna I6X Max <sup>6,19</sup> CD-RW e (black) I/DVD-R Drive (blac 8.0" v.i.s.) Monitor ( 19.8" v.i.s.) Monitor " Flat Panel Monitor Flat Panel Monitor (beyboard and mouse	JDIMM 10K0069 IMM 10K0071 1) 22P7157 1) 09N4207 1) 09N4226 19K4646 sk 06P5751 sk 06P5752 I (black) 22P6976 /DVD-ROM 22P6959 black) 6551U3N (black) 6652U3N (black) 6657HG2 1 (black) 22P5170 33L3252	<ul> <li>Interna</li> <li>On site coverage next but on site eligible</li> <li>3yr IC responsive to the site of th</li></ul>	parts and labor tional Warranty Service <sup>3</sup> to 8 am - 5 pm, Mon - Fri ge excluding holidays, usiness day response time service upgrade options (in locations): <sup>7</sup> DR Mon-Fri 8-5, 4 hr average onse (ServicePac® 41L2735) DR 7 day x 24 hr, 4 hr average onse (ServicePac 41L2741) DR Mon-Fri 8-5, next business esponse (ServicePac 69P9167) DR Mon-Fri 8-5, 4 hr average onse (ServicePac 69P9168) DR 7 day x 24 hr, 4 hr average onse (ServicePac 69P9169) toll-free support for warranty during the warranty period

IBM® Type-model Processo	L2 FSB r GHz¹ cache MHz Memo	•		Graphics adapter		Slots x Available bays Preload <sup>17</sup> date
6216-64U Pentium 4	1 2.8 512KB 533 256N	IB 40GB 7200	None CD-ROM None CD-ROM	Quadro <sup>®</sup> 4 280N Quadro4 580XG	VS 64MB GL 64MB	34x3 Windows® XP Pro Mar03 4x3 Windows XP Pro Mar03 4x3 Windows XP Pro Mar03 4x3 Windows XP Pro Mar03
Positioning Processor	Essential workstation peri Intel® Pentium 4 at 2.80 with 533MHz frontside b	GHz		Low-profile	Desktop	diskette CD-ROM disk
L2 cache Implementation SMP support	<b>512KB</b> std and max / ECC Processor and L2 cache i No SMP support	C / fùll spéed	GA478 socket	Bay ① 3.5",	   SL 1", a   HH 1.6", a	ccess, std diskette
Memory - std/max Memory - sockets Memory - type	256MB / 2GB <sup>13</sup> max Two 184-pin gold-plated I PC2100 266MHz DDR-S Correcting (ECC) DIMM industry std / unbuffered /	ORAM / Error Che and ECC memor	ecking and y controller /	Bay 3 3.5", Slot 1: low- Slot 2: low- Slot 3: low-	SL 1", n profile, 32-bit profile, 32-bit profile, 32-bit	o access, std disk AGP 4X (1.5v) - used PCI 2.2 (5v)
Graphics controller (one of following)	Matrox® Millennium Gradapter / MGA G450F Cdual RAMDAC [360/23z connector (ships with or NVIDIA® Quadro4 280 NV17LT 250MHz GPU dual 350MHz RAMDAC monitor / LFH60 connector NVIDIA Quadro4 580X NV18GL 300MHz GPU dual 350MHz RAMDAC LFH60 connector include.	GPU / 32MB 150MI MHz] / dual head s ee cable with two D NVS (high-perf 2E / 64MB 200MHz s / dual head: 2048 tor for std cable wi GL (entry 3D) / AG / 64MB 275MHz E s / dual head: 204	Hz DDR-SDRAM / support / one DVI-I vB-15 analog conns) v) / AGP 8X adapte DDR SDRAM / sx1536x16M each th two DB-15 analog GP 8X adapter / DDR-SDRAM / 8x1536x16M each r	Stealth bla 14.2" W X 360mm W 20.0 to 22. Bays 1 and Toolless ca Toolless A Support fo	ck color 16.2"D X 4.1' X 412mm D 2 0 lb (9.1 to 10	"H X 104mm H J.0 kg) atched and pivoting) ounting slots
SCSI disk controller	SCSI model: Adaptec®	29160LP / single of	channel Wide Ultra	160 SCSI (LVD 1	60MB/sec) / 6	64-bit 33MHz PCI adapter
SCSI connectors Disk controller Cables	(in a 32-bit slot) / one cha SCSI model: One 68-pir Enhanced IDE / ATA-100 SCSI model: One 1-drop EIDE models: Two EIDE	internal SCSI con / integrated in I/O ( 16-bit LVD SCSI ( 80-conductor cable	nector / one 0.8mm ' Controller Hub / two cable, one 1-drop El	connectors on pla DE 80-conductor	anar	ected to CD-ROM)
Disk	one 1-drop SCSI model: 18.2GB UI EIDE models: 40GB EIDE					SECURITY U-bolt support via knockout ey lock (on rear)
Diskette / CD-ROM Rack support Chipset	3.5" 1.44MB diskette driv None Intel 845E chipset / 8284 82801DB I/O Controller H ethernet MAC, USB, Low SMSC® LPC47M102 Sup	5E Memory Contro ub (ICH4) for PCI Pin Count Interfac	oller Hub (MCH) / 2.2 bus, ATA-100 EI e / Firmware Hub /		<ul><li>Secure fi</li><li>Power-or</li><li>Administ</li><li>Boot seq</li><li>Boot with</li></ul>	n password rator password uence control nout keyboard or mouse
Ports	Front: two USB (Ver 2.0) Back: two 9-pin serial, pa	rallel, two USB (Ve	er 2.0), keyboard, mo	ouse,		boot inhibit and write-protect disk, serial port, parallel port ol
Audio connectors	ethernet, monitor Integrated digital audio / S (done by processor and IO (analog mixing, Analog-to Back: microphone-in (m	CH4) / AC '97 inter Digital and Digital- Dno), line-in (stere	face / Realtec®ALC2 -to-Analog conversio	02 codec / n)	<ul><li>Secure re</li><li>VPD stor</li><li>Write pro</li></ul>	access openings emovable media red in EEPROM otection control for EEPROM labels on most components
Speakers Ethernet Security chip	One internal speaker for b 10/100/1000 gigabit / Bro- full duplex / PHY and MAC None	adcom® BCM 5702			80GB <sup>13</sup> (	m internal EIDE disk capacity: 1 disk x 80GB 7200 rpm) m internal SCSI disk capacity:
Keyboard / mouse Cooling fans	104-key (rubber dome) ke Two or three variable spe	ed fans (power spl	y, fansink, SCSI mod	del has third fan)		(1 disk x 73.4GB 10000 rpm)  IMITED WARRANTY <sup>3</sup>
Power supply	160 watts with variable sp		I / manual switch			parts and labor
Microsoft® Windows - Lotus® SmartSuit - Lotus Notes® Clie - Disk-to-Disk Rec - Device Drivers a  • Configuration/Se - pressing F1 at st - Product Recove - startup - Systems manage - Remote Deploym - IBM Director Age - System Migration	te® Millennium license ent license overy (in Service Partition and Diagnostics CD-ROM etup Utility invoked by artup ry by pressing F11 at ement capabilities: nent Manager, ent, an Assistant ation Model (CIM) 2.2 and Management 1.2 juration and (ACPI) 1.0b	256MB PC2100 512MB PC2100 1GB PC2100 CL 40GB IDE Disk / 60GB IDE Disk / 80GB IDE Disk / PCI Ultra160 SC 36.4GB 10K rpr 48X/24X/48X Ma 48X/24X/48X Ma 48X/24X/48X/16 Combo drive IBM DVD-RAM// IBM P97 19" (18 IBM P275 21" (1 IBM T545 15.1" IBM T545 15.1" IBM Wireless ke Spaceball 3D In	n Ultra160 SCSI Dis m Ultra160 SCSI Di ax <sup>6</sup> CD-RW internal SX Max <sup>6,19</sup> CD-RW/I e (black) DVD-R Drive (black 8.0" v.i.s.) Monitor (b 9.8" v.i.s.) Monitor ( Flat Panel Monitor (blat Panel Monitor (blat Panel Monitor)	DIMM 10K0069 MM 10K0071 22P7157 0 99N4226 19K4646 k 06P5751 sk 06P5752 (black) 22P6997 DVD-ROM 22P7031 22P6959 lack) 6551U3N black) 6652U3N black) 6653HG2 ack) 6657HG2 (black) 22P5170 33L3252	<ul> <li>On site, coverage next but the eligible</li> <li>3yr IO respo</li> <li>4yr IO day respo</li> <li>4yr IO respo</li> <li>24yr IO respo</li> <li>24xr IO respo</li> </ul>	tional Warranty Service <sup>3</sup> , 8 am - 5 pm, Mon - Fri ge excluding holidays, siness day response time service upgrade options (in locations): <sup>7</sup> PR Mon-Fri 8-5, 4 hr average onse (ServicePac® 41L2735) PR 7 day x 24 hr, 4 hr average onse (ServicePac 41L2741) PR Mon-Fri 8-5, next business seponse (ServicePac 69P9167) PR Mon-Fri 8-5, 4 hr average onse (ServicePac 69P9168) PR 7 day x 24 hr, 4 hr average onse (ServicePac 69P9169) toll-free support for warranty during the warranty period

IBM® L2 FSB Type-model Processor GHz¹ cache MHz Memory Disk and	SCSI		
			Slots x Available
<ul> <li>6226-30U Pentium 4 2.26 512KB 533 256MB 40GB</li> <li>6226-32U Pentium 4 2.26 512KB 533 256MB 40GB</li> <li>6226-35U Pentium 4 2.26 512KB 533 256MB 18.2GB</li> <li>6226-40U Pentium 4 2.4 512KB 533 256MB 40GB</li> <li>6226-42U Pentium 4 2.4 512KB 533 256MB 40GB</li> </ul>	7200 None CD-ROM Mi 7200 None CD-ROM NV 7200 None CD-ROM NV 7200 None CD-ROM NV 10K 29160LP CD-ROM AT 7200 None CD-ROM Mi	VIDIA™ Quadro4 64I Illennium G450 DVI-I VIDIA Quadro4 64M I™Fire GL8800™.11 Illennium G450 DVI-I VIDIA Quadro4 64M	-I 32MB 4x4 Windows® XP Pro Aug 02 MB 4x4 Windows XP Pro Aug 02 I 32MB 4x4 Windows XP Pro Aug 02 IB 4x4 Windows XP Pro Aug 02 I 32MB 4x4 Windows XP Pro Aug 02
Positioning Processor Intel® Pentium 4 at 2.0, 2.26, or 2.4G with 400 or 533MHz frontside bus (F L2 cache Implementation SMP support  Essential workstation performance Note of Pentium 4 at 2.0, 2.26, or 2.4G with 400 or 533MHz frontside bus (F 512KB std and max / ECC / full speed Processor and L2 cache in FC-PGA2 in No SMP support	FSB)	Full-size Desktop	diskette Optical disk ②
Memory - std/max Memory - sockets Memory - type  256MB / 2GB <sup>13</sup> max Two 184-pin gold-plated DIMM socket PC2100 266MHz DDR-SDRAM / Erro Correcting (ECC) DIMMs and ECC m industry std / unbuffered / CAS Latence	or Checking and nemory controller / y 2.5 (CL2.5)	Slot 2: full-length,	1.6" access, open 1", access, std diskette
Graphics controller (one of following)  • Matrox® Millennium G450 DVI-I (se • NVIDIA Quadro4 200NVS (high-per NV17LT 250MHz GPU / 64MB 166M dual 350MHz RAMDACs / dual head monitor / LFH60 connector for std ca • ATI Fire GL8800™.11 (advanced 3D) / 8800 GPU / 128MB 300MHz DDR-S [400/165MHz] / dual head support / c one DVI-I connector (ships with one	f 2D) / AGP 4X adapter / // AGP 4X adapter / : 2048x1536x16M each ble with two DB-15 analog / AGP 4X adapter / Radeon™ GRAM / dual RAMDAC one DB-15 analog and	Slot 4: full-length, • 16.7" W X 16.7" I • 425mm W X 425 • 23 to 25 lb (10.46 • Stealth black cold • Bay 1 and 2 in ca • Bay 3 and 4 in ca • Toolless rails for	full-height, 32-bit PCI 2.2 (5v) - SCSI in D X 5.5" H some some of the some some of the some some some some some some some som
SCSI disk controller SCSI model: Adaptec® 29160LP / si Ultra160 SCSI (LVD 160MB/sec) / 64- (in a 32-bit slot) / one channel with up to SCSI connectors Disk controller SCSI models: One 68-pin internal SCSI models: One 68-pin interna	·bit 33MHz PCI adapter to 15 device support SI connector / one 0.8mm VHI	DCI 68-pin external S	
Cables SCSI models: One 3-drop 16-bit LVD: EIDE models: Two EIDE 80-conducto one 1-drop cable to disk Disk SCSI models: 18.2GB Ultra160 SCSI EIDE models: 40GB EIDE / ATA-100 /	SCSI cable, one 2-drop EIDE r cables (one 2-drop cable to 0 <) / 10000 rpm / 4.9 ms read /	cable CD, S.M.A.R.T. <sup>5</sup> • Co	SECURITY  optional U-bolt support via knockout over key lock (on rear) over tamper detect switch
Diskette / CD-ROM 3.5" 1.44MB diskette drive / 48X-20X Chipset Intel 845E chipset / 82845E Memory 82801DB I/O Controller Hub (ICH4) fo ethernet MAC, USB, Low Pin Count In SMSC® LPC47M102 Super I/O for disk	Controller Hub (MCH) / r PCI 2.2 bus, ATA-100 EIDE, terface / Firmware Hub /	• Po • Ao • Bo • Bo	ecure fixed DASD ower-on password dministrator password oot sequence control oot without keyboard or mouse iskette boot inhibit and write-protect
Ports  Front: two USB (Ver 2.0); Back: two 9 keyboard, mouse, ethernet, monitor Integrated digital audio / SoundMAX® ( (done by processor and ICH4) / AC '97 (analog mixing, Analog-to-Digital and E Back: microphone-in (mono), line-in ( One internal speaker for business aud	3.0 with SPX™ / software-base 7 interface / Realtec®ALC202 Digital-to-Analog conversion) (stereo), line-out (stereo) [all 3 io	(Ver 2.0), ed audio codec / 3.5mm] • Di I/C • Se • Se • VI • W	iskette, disk, serial port, parallel port O control ecure access openings ecure removable media PD stored in EEPROM /rite protection control for EEPROM arcode labels on most components
Ethernet 10/100/1000 gigabit / Broadcom® BCN full duplex / PHY and MAC layers / Wa None  Keyboard / mouse 104-key (rubber dome) keyboard / IBN	ake on LAN® / Alert Standard F	Format 1.0 16 16 14	Maximum internal EIDE disk capacity: 60GB <sup>13</sup> (2 disks x 80GB 7200 rpm) Maximum internal SCSI disk capacity: 46.8GB <sup>13</sup> (2 disks x 73.4GB 10000 rpm)
Coóling fans Power supply  Three or four variable spd fans (pwr su 200 watts with variable speed fan / uni  Preload with Windows XP Professional  Lotus® SmartSuite® Millennium license Lotus Notes® Client license Disk-to-Disk Recovery (in Service Partition)  Device Drivers and Diagnostics CD-ROM  Three or four variable spd fans (pwr su 200 watts with variable speed fan / uni 200 watts with vari	ip, fansink, rear, SCSI models	MM 10K0067 MM 10K0069 1 10K0071 22P7157 09N4207	LIMITED WARRANTY <sup>3</sup> Byear 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 On site service upgrade options (in

- · Configuration/Setup Utility invoked by pressing F1 at startup
  Product Recovery by pressing F11 at
- startup
- Systems management capabilities: Remote Deployment Manager, IBM Director Agent, System Migration Assistant
- Common Information Model (CIM) 2.2
- PC 2001-compliant
- Advanced Power Management 1.2 Advanced Configuration and
- Power Interface (ACPI) 1.0b System Management BIOS
- DMI 2.0-compliant

80GB IDE Disk ATA-100 (7200 rpm) PCI Ultra160 SCSI Adapter 09N4226 19K4646 36.4GB 10K rpm Ultra160 SCSI Disk 06P5751 73.4GB 10K rpm Ultra160 SCSI Disk 06P5752 40X/12X/40X Max<sup>6</sup> CD-RW internal (black)22P6976 32X/10X/40X/16X Max<sup>6,19</sup> CD-RW/DVD-ROM

Combo drive (black)
IBM DVD-RAM/DVD-R Drive (black) 22P6973 22P6959 IBM P97 19" (18.0" v.i.s.) Monitor (black) 6551U3N IBM P275 21" (19.8" v.i.s.) Monitor (black) 6652U3N IBM T545 15.1" Flat Panel Monitor (black) 6653HG2 IBM T750 17" Flat Panel Monitor (black) 6657HG2 IBM Wireless keyboard and mouse (black) 22P5170 Spaceball 3D Input Device 33L3252 Spaceball 3D Input Device Other options at **ibm.com**/pc/us/accessories

- eligible locations):7
- 3yr IOR Mon-Fri 8-5, 4 hr average response (ServicePac® 41L2735)
- 3yr IOR 7 day x 24 hr, 4 hr average response (ServicePac 41L2741)
- · 4yr IOR Mon-Fri 8-5, next business day response (ServicePac 69P9167)
- 4yr IOR Mon-Fri 8-5, 4 hr average response (ServicePac 69P9168)
- 4yr IOR 7 day x 24 hr, 4 hr average response (ServicePac 69P9169)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period

IntelliStat	ion <sup>®</sup> E Pro (6226)	- November 2002	xREF b	y eServer Field Skills Enablement Team
6226-50U Pentium 6226-52U Pentium 6226-54U Pentium	4 2.67 512KB 533 256M 4 2.67 512KB 533 256M	IB 40GB <sup>2</sup> 7200 None	Millennium G450 Quadro®4 200N Quadro4 580XG	L 64MB 4x4 Windows XP Pro Nov 02
Positioning Processor L2 cache Implementation SMP support Memory - std/max Memory - sockets Memory - type	No SMP support  256MB / 2GB <sup>13</sup> max Two 184-pin gold-plated D PC2100 266MHz DDR-SD	Hz us (FSB) / full speed FC-PGA2 in mPGA478 socket  IMM sockets / one socket used FAM / Error Checking and and ECC memory controller /	Bay ② 5.25", Bay ③ 3.5", Bay ④ 3.5", Slot 1: full-le	diskette Optical  a HH 1.6", access, std CD-ROM  HH 1.6" access, open
	<ul> <li>NVIDIA® Quadro4 200N NV17LT 250MHz GPU / dual 350MHz RAMDACs monitor / LFH60 connect analog connectors</li> <li>NVIDIA Quadro4 580X0 NV18GL 300MHz GPU / dual 350MHz RAMDACs</li> </ul>	50 DVI-I (see the 6216 sheet for specs) VS (high-perf 2D) / AGP 4X adapter / 64MB 166MHz SDRAM / / dual head: 2048x1536x16M each or for std cable with two DB-15  GL (entry 3D) / AGP 8X adapter / 64MB 275MHz DDR-SDRAM / s / dual head: 2048x1536x16M each tor including std cable with two DB-15	Slot 4: full-le Stealth blac 16.7" W X 1 425mm W 2 23 to 25 lb ( Bay 1 and 2 Bay 3 and 4 Toolless ra	ength, full-height, 32-bit PCI 2.2 (5v) ength, full-height, 32-bit PCI 2.2 (5v) - SCSI in sch color 16.7" D X 5.5" H X 425mm D X 140mm H (10.46 to 11.36kg) in cage flips up (latched and pivoting) 4 in cage flips up (latched and pivoting) ils for disk mounting over removal; toolless AGP and PCI slots
SCSI disk controller SCSI connectors Disk controller Cables Disk	Ultra160 SCSI (LVĎ 160M (in a 32-bit slot) / one chan SCSI model: One 68-pin i Enhanced IDE / ATA-100 / SCSI model: One 3-drop EIDE models: Two EIDE 8 one 1-drop o SCSI model: 18.2GB Ultr	9160LP/single channel Wide  IB/sec) / 64-bit 33MHz PCI adapter nel with up to 15 device support internal SCSI connector / one 0.8mm VI integrated in I/O Controller Hub / two co 16-bit LVD SCSI cable, one 2-drop EID 0-conductor cables (one 2-drop cable to cable to disk) ra160 SCSI / 10000 rpm / 4.9 ms read / ATA-100 / 7200 rpm / 9.0 ms read see	onnectors on place E cable o CD, / S.M.A.R.T. <sup>5</sup>	SECURITY  Optional U-bolt support via knockout Cover key lock (on rear) Cover tamper detect switch
Ports	Intel 845E chipset / 82845 82801 DB I/O Controller Hu ethernet MAC, USB, Low F SMSC® LPC47M102 Supe Front: two USB (Ver 2.0); keyboard, mouse, ethernet	e / 48X-20X <sup>6</sup> CD-ROM, bootable 5E Memory Controller Hub (MCH) / 4b (ICH4) for PCI 2.2 bus, ATA-100 EID Pin Count Interface / Firmware Hub / er I/O for diskette, parallel, serial, keyboa Back: two 9-pin serial, parallel, two USI t, monitor	ard, mouse B (Ver 2.0),	Secure fixed DASD     Power-on password     Administrator password     Boot sequence control     Boot without keyboard or mouse     Diskette boot inhibit and write-protect     Diskette, disk, serial port, parallel port I/O control     Secure access openings
Audio connectors Speakers Ethernet Security chip	(done by processor and IC (analog mixing, Analog-to-I Back: microphone-in (mo One internal speaker for bu 10/100/1000 gigabit / Broa	DundMAX® 3.0 with SPX™ / software-ba H4) / AC '97 interface / Realtec®ALC20; Digital and Digital-to-Analog conversion) no), line-in (stereo), line-out (stereo) [al usiness audio dcom® BCM 5702 / on planar / PCI 2.2 3 layers / Wake on LAN® / Alert Standard	2 codec /     3.5mm]   32-bit 33MHz /	Secure removable media VPD stored in EEPROM Write protection control for EEPROM Barcode labels on most components  Maximum internal EIDE disk capacity: 160GB¹³ (2 disks x 80GB 7200 rpm) Maximum internal SCSI disk capacity:
Keyboard / mouse Cooling fans Power supply	Three or four variable spd	/board / IBM 3-button mouse fans (pwr sup, fansink, rear, SCSI mode eed fan / universal / manual switch	els have 4th fan)	146.8GB¹³ (2 disks x 73.4GB 10000 rpm)  LIMITED WARRANTY³
Microsoft® Window - Lotus® SmartSu - Lotus Notes® CI - Disk-to-Disk Re   Device Drivers	covery (in Service Partition) and Diagnostics CD-ROM Setup Utility invoked by	Options 256MB PC2100 CL2.5 ECC DDR UD 512MB PC2100 CL2.5 ECC DDR UD 1GB PC2100 CL2.5 ECC DDR UDIM 40GB IDE Disk ATA-100 (7200 rpm) 60GB IDE Disk ATA-100 (7200 rpm) 80GB IDE Disk ATA-100 (7200 rpm) PCI Ultra160 SCSI Adapter	IMM 10K0069	<ul> <li>⇒ International Warranty Service³</li> <li>⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time</li> <li>⇒ On site service upgrade options (in eligible locations):²</li> <li>• 3 yr IOR Mon-Fri 8-5. 4 hr average</li> </ul>

- pressing F1 at startup
- Product Recovery by pressing F11 at startup
- Systems management capabilities: Remote Deployment Manager, IBM Director Agent, System Migration Assistant
- Common Information Model (CIM) 2.2
- PC 2001-compliant
- Advanced Power Management 1.2 Advanced Configuration and
- Power Interface (ACPI) 1.0b System Management BIOS
- DMI 2.0-compliant

PCI Ultra160 SCSI Adapter 19K4646 36.4GB 10K rpm Ultra160 SCSI Disk 06P5751 73.4GB 10K rpm Ultra160 SCSI Disk 06P: 40X/12X/40X Max<sup>6</sup> CD-RW internal (black) 22P 32X/10X/40X/16X Max<sup>6,19</sup> CD-RW/DVD-ROM 06P5752 22P6976

Combo drive (black)
IBM DVD-RAM/DVD-R Drive (black) 22P6973 22P6959 IBM P97 19" (18.0" v.i.s.) Monitor (black) 6551U3N IBM P275 21" (19.8" v.i.s.) Monitor (black) 6652U3N IBM T545 15.1" Flat Panel Monitor (black) 6653HG2 IBM T750 17" Flat Panel Monitor (black) 6657HG2 IBM Wireless keyboard and mouse (black) 22P5170 Spaceball 3D Input Device 33L3252 Spaceball 3D Input Device Other options at ibm.com/pc/us/accessories

- 3yr IOR Mon-Fri 8-5, 4 hr average response (ServicePac® 41L2735)
- 3yr IOR 7 day x 24 hr, 4 hr average response (ServicePac 41L2741)
- · 4yr IOR Mon-Fri 8-5, next business day response (ServicePac 69P9167)
- 4yr IOR Mon-Fri 8-5, 4 hr average response (ServicePac 69P9168)
- 4yr IOR 7 day x 24 hr, 4 hr average response (ServicePac 69P9169)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period

M IntelliStati	ion® E Pro (6226)	- February 2003		xREF by	y eServer Field S	kills Enablement Team
IBM® Type-model Processo		SCSI ory Disk and rpm adapter C	·	•		Available Preload <sup>17</sup> date
	4 2.8 512KB 533 256M 4 2.8 512KB 533 256M	IB 40GB 7200 None C	D-ROM Qua	dro®4 280N\ dro4 580XG	VS 64MB 4x4 V L 64MB 4x4 V	Vindows® XP Pro Mar 03 Vindows XP Pro Mar 03 Vindows XP Pro Mar 03 Vindows XP Pro Mar 03
Positioning Processor L2 cache Implementation SMP support	Essential workstation performed Intel® Pentium 4 at 2.8G with 533MHz frontside bu 512KB std and max / ECC Processor and L2 cache in No SMP support	i <b>Hz</b> u <b>s</b> (FSB)	ket	Full-size Des	HH 1.6", access,	diskette Optical disk  astd CD-ROM
Memory - std/max Memory - sockets Memory - type	PC2100 266MHz DDR-SD	IMM sockets / one socket use PRAM / Error Checking and and ECC memory controller / CAS Latency 2.5 (CL2.5)	ed /	Bay ② 5.25", Bay ③ 3.5", Bay ④ 3.5", Slot 1: full-ler Slot 2: full-ler	HH 1.6" access, SL 1", access, SL 1", no acces ngth, full-height, 32- ngth, full-height, 32-	open std diskette ss, std disk bit AGP 4X (1.5v) - used bit PCI 2.2 (5v)
	<ul> <li>NVIDIA® Quadro4 280N NV17LT 250MHz GPU / dual 350MHz RAMDACs monitor / LFH60 connect analog connectors</li> <li>NVIDIA Quadro4 580X0 NV18GL 300MHz GPU / dual 350MHz RAMDACs</li> </ul>	50 DVI-I (see the 6216 sheet in the first shade to the first shade to be shade	( adapter / M / each 5 oter / M / M each	Slot 4: full-ler     Stealth blac     16.7" W X 1     425mm W X     23 to 25 lb (     Bay 1 and 2     Bay 3 and 4     Toolless rail	k color 6.7" D X 5.5" H ( 425mm D X 140m 10.46 to 11.36kg) in cage flips up (lat in cage flips up (lat ls for disk mounting	bit PCI 2.2 (5v) - SCSI in some Im H  ched and pivoting) ched and pivoting)
SCSI disk controller SCSI connectors Disk controller Cables Disk	Ultra160 SCSI (LVĎ 160M (in a 32-bit slot) / one chan SCSI model: One 68-pin Enhanced IDE / ATA-100 / SCSI model: One 3-drop EIDE models: Two EIDE 8 one 1-drop o SCSI model: 18.2GB Ultr	9160LP/single channel Wid IB/sec) / 64-bit 33MHz PCI ad nel with up to 15 device suppor internal SCSI connector / one integrated in I/O Controller H: 16-bit LVD SCSI cable, one 2 0-conductor cables (one 2-dro cable to disk) ra160 SCSI / 10000 rpm / 4.9 / ATA-100 / 7200 rpm / 9.0 m	dapter ort 0.8mm VHD0 lub / two conno 2-drop EIDE ca rop cable to CI 9 ms read / S	ectors on plan able D, i.M.A.R.T. <sup>5</sup>	• Optional U-bolt : • Cover key lock ( • Cover tamper de	ECURITY support via knockout on rear) etect switch
Diskette / CD-ROM Chipset	Intel 845E chipset / 82845 82801DB I/O Controller Hu ethernet MAC, USB, Low F	/48X-20X <sup>4</sup> CD-ROM, bootabl 5E Memory Controller Hub (M Jb (ICH4) for PCI 2.2 bus, ATA Pin Count Interface / Firmware er I/O for diskette, parallel, seri	ICH) / A-100 EIDE, e Hub /	mouse	<ul> <li>Secure fixed DA</li> <li>Power-on passy</li> <li>Administrator pa</li> <li>Boot sequence of Boot without key</li> <li>Diskette boot inference of Diskette boot inference of Di</li></ul>	vord issword control
Ports Audio Audio connectors Speakers	keyboard, mouse, ethernet Integrated digital audio / So (done by processor and IC (analog mixing, Analog-to-	oundMAX® 3.0 with SPX™ / so H4) / AC '97 interface / Realte Digital and Digital-to-Analog co no), line-in (stereo), line-out (	oftware-based ec®ALC202 co onversion)	audio odec/	<ul> <li>Diskette, disk, s I/O control</li> <li>Secure access of Secure removal</li> <li>VPD stored in E</li> <li>Write protection</li> </ul>	erial port, parallel port openings ble media
Security chip  Keyboard / mouse	10/100/1000 gigabit / Broa full duplex / PHY and MAC None	dcom® BCM 5702 / on planar layers / Wake on LAN® / Aler			160GB <sup>13</sup> (2 disk • Maximum interi	nal EIDE disk capacity: is x 80GB 7200 rpm) nal SCSI disk capacity: ks x 73.4GB 10000 rpm)
Keyboard / mouse Cooling fans Power supply	Three or four variable spd 200 watts with variable spe	/board / IBM 3-button mouse fans (pwr sup, fansink, rear, S eed fan / universal / manual sv	SCSI models h	nave 4th fan)	<u> </u>	D WARRANTY <sup>3</sup>
Microsoft® Window - Lotus® SmartSu - Lotus Notes® Cl - Disk-to-Disk Re	ndows XP Professional 17 rs® XP Professional ite® Millennium license ient license covery (in Service Partition) and Diagnostics CD-ROM tetup Utility invoked by	Options 256MB PC2100 CL2.5 ECC 512MB PC2100 CL2.5 ECC 1GB PC2100 CL2.5 ECC D 40GB IDE Disk ATA-100 (7 60GB IDE Disk ATA-100 (7 80GB IDE Disk ATA-100 (7	C DDR UDIMN DDR UDIMM 7200 rpm) 7200 rpm) 7200 rpm)	M 10K0067 M 10K0069 10K0071 22P7157	<ul> <li>International V</li> <li>On site, 8 am coverage exclusionext business</li> </ul>	Varranty Service <sup>3</sup> 5 pm, Mon - Fri uding holidays, day response time e upgrade options (in

- Configuration/Setup Utility invoked by pressing F1 at startup Product Recovery by pressing F11 at
- Systems management capabilities: Remote Deployment Manager, IBM Director Agent, System Migration Assistant
- Common Information Model (CIM) 2.2
- PC 2001-compliant
- Advanced Power Management 1.2 Advanced Configuration and Power Interface (ACPI) 1.0b
- System Management BIOS
- DMI 2.0-compliant

PCI Ultra160 SCSI Adapter 19K4646 36.4GB 10K rpm Ultra160 SCSI Disk 06P5751 73.4GB 10K rpm Ultra160 SCSI Disk 06P5752 48X/24X/48X Max<sup>6</sup> CD-RW internal (black)22P6997 48X/24X/48X/16X Max<sup>6,19</sup> CD-RW/DVD-ROM

Combo drive (black)
IBM DVD-RAM/DVD-R Drive (black) 22P7031 22P6959 IBM DVD-HAM/DVD-H Drive (black) 22P6959
IBM P97 19" (18.0" v.i.s.) Monitor (black) 6551U3N
IBM P275 21" (19.8" v.i.s.) Monitor (black) 6652U3N
IBM T545 15.1" Flat Panel Monitor (black) 6653HG2
IBM T750 17" Flat Panel Monitor (black) 6657HG2
IBM Wireless keyboard and mouse (black)22P5170
Spaceball 3D Input Device 33L3252

Other options at ibm.com/pc/us/accessories

- - 3yr IOR Mon-Fri 8-5, 4 hr average response (ServicePac® 41L2735)
  - 3yr IOR 7 day x 24 hr, 4 hr average response (ServicePac 41L2741)
  - 4yr IOR Mon-Fri 8-5, next business day response (ServicePac 69P9167)
  - 4yr IOR Mon-Fri 8-5, 4 hr average response (ServicePac 69P9168)
  - 4yr IOR 7 day x 24 hr, 4 hr average response (ServicePac 69P9169)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period

	IBM® Type-model Processo	FSB r GHz <sup>1</sup> MHz Memory Disk and I	Disk pm controllers	Graphics Optical and me		Available Preload <sup>17</sup> date
X	6219-12U Pentium 6219-21U Pentium 6219-26U Pentium 6219-32U Pentium 6219-36U Pentium 6219-37U Pentium 6219-42U Pentium	4 3.06 533 512MB 40.0GBEID 4 3.06 533 512MB 36.4GBU32	E 7.2K EIDE 20 10K Ultra320, EID 20 10K Ultra320, EID E 7.2K EIDE 0 10K Ultra320, EID 0 10K Ultra320, EID E 7.2K EIDE 0 10K Ultra320, EID	CD Quadro4 280NV E Combo Millennium G45 E CD-RW Quadro4 980X0 CD Quadro4 280NV E CD-RW Quadro4 980XG E CD-RW Wildcat 4 <sup>TM</sup> 7110 CD Quadro4 280NV	0 DVI-I 32MB6x7 1394 GL 128MB 6x7 1394 S 64MB 6x7 L 128MBB 6x7 1394 0 256MB 6x7 1394 S 64MB 6x7 L 128MBB 6x7 1394	XP Pro Jan 2003 XP Pro Jan 2003
	L2 cache	Intel® Pentium 4 at 2.4B, 2.67, 2 512KB std and max / at process No SMP support Motherboard contains one mPG, ethernet controller, three PCI slo	or speed \478B socket (proces	sor/L2 cache in FC-PGA2),	four DIMM sockets, one A	GP slot,
	Memory - features	<b>256MB</b> , <b>512MB</b> or <b>1GB</b> std / 4G CL2.5 DDR-SDRAM DIMMs / fo bank] / 2-way memory interleave	ur DIMM gold-connec	ctor slots on systemboard /	DIMMs must be installed	in matched pairs [a
	(one of following)	Matrox® Millennium G450 DV dual RAMDAC [360/232MHz] /     NVIDIA™ Quadro4 280NVS (h 350MHz RAMDACs / dual head: 8NVIDIA Quadro4 980XGL (adual head: 2048x1536x16M eadual head: 2048x16M eadual head: 2048x1536x16M eadual headual head: 2048x1536x16M eadual head: 2048x1536x16M eadual head: 2048x1536x16M eadual head:	dual head support / or igh-perf 2D) / AGP 8) I: 2048x1536x16M eavanced 3D) / AGP 8) ach monitor / two DV eme 3D) / AGP 8X Pro MDAC [320/280MHz	ne DVİ-I connector (ships wit ( adapter / NV18LT 275MHz ach monitor / LFH60 connect ( adapter / 128MB 325MHz -I connectors (ships with two b 50 adapter / 256MB total D ] / dual head support (up to to	h one cable with two DB-15 CGPU / 64MB 200MHz DE or for std cable with two DE DDR-SDRAM / dual 350I o DVI-I to DB-15 dongles) DR-SDRAM (128MB fram wo digital or analog monito	5 analog conns) DR-SDRAM / dual 3-15 analog MHz RAMDACs / he buffer,
	Cables	one 16-bit chann EIDE models: Two EIDE cables SCSI models: One 4-drop 16-b	901 / single channel U I 2.2 / one 68-pin inte el (internal only) s (one 2-drop cable to t 68-pin LVD SCSI ca	Jitra320 SCSI controller (I ernal connector on extender o CD-ROM, one 2-drop cablable from extender to int dis	LVD 320MB/sec) / on exter board / no external SCSI e to EIDE disk) ks bays, one 2-drop EIDE	connector /  E cable (to optical)
	Disk - features	Some: 40.0GB EIDE / ATA-100	/ 7200 rpm / 9.0 ms s	seek; Some: 36.4GB Ultra3	20 SCSI / 10K rpm / 4.7 n	ns; <i>All:</i> S.M.A.R.Ť. <sup>5</sup>
	Rack support Chipset	4U <sup>4</sup> rack mount support via tow Intel E7205 chipset / E7205 MC bus (five slots and one Mini PCI s SMC 47M102 Super I/O off LPC	H (Memory Controlle			
	Diskette drive Optical drive IEEE 1394 (FireWire) Audio	One gigabit 10/100/1000 etherne chip on planar / PCI-X 64-bit 100 3.5" 1.44MB diskette drive One of following: 48X-20X <sup>6</sup> CD-ISome: FireWire controller in Mi Soft audio AC '97 v2.2 interface Two USB (Ver 2.0), two 9-pin se Two USB (Ver 2.0), audio line of Monitoring and alerting of therm	MHz (limited to PCI 2. ROM, 32X/10X/40X/1 ni PCI slot / 1394A, via ICH4 (AD1885) / rial, parallel, keyboar at (stereo), mic in / so	.2 32-bit 33MHz) / full duple: 6X Max <sup>6,19</sup> CD-RW/DVD-RC 400Mbps, 6-pin port on re- internal speaker (use of aud d, mouse, ethernet, audio li bme: 4-pin 1394 FireWire	Make on LAN® / Alert Si OM Combo, or 40X/24X/40 ar, 4-pin port on front dio line out requires power ine in, audio line out, mic in	tandard Format 1.0 DX Max <sup>6</sup> CD-RW red speakers) n/some: 6-pin 1394
(	Keyboard / mouse Cooling fans Power supply	IBM 104-key keyboard (6-pin PS Three variable speed fans (pwr s 340 watts / universal / auto sensi	upply, rear, processo	r) / not redundant or hot-swa	U-bolt anchoring featu optional; supports optional; Security slot (for attack cable lock such as Ker	onàl padlock) nment of optional
	Optical Bay Bay Bay Bay Bay Bay Bay	① 5.25", HH 1.6", access, optic ② 5.25", HH 1.6", access, oper ③ 3.5", SL 1", access, disk ④ 3.5", SL 1", no access, disk ⑥ 3.5", SL 1", no access, oper ⑦ 3.5", SL 1", no access, oper	rotates out of the test of the test out of the test of	abilizing feet	Side cover key lock     Cover tamper detect s     Secure fixed DASD     Power-on password     Administrator passworr     Keyboard/mouse pass     Boot sequence control     Boot without keyboard	witch  d word
	© Slot -N Slot Slot Slot Slot Slot Slot Slot Slot	1: fullsize, 32-bit 33MHz, PCI 2.2 (A on models with Wildcat4 7110 2: fullsize, 32-bit 33MHz, PCI 2.2 3: fullsize, 32-bit 33MHz, PCI 2.2 4: fullsize, 32-bit 33MHz, PCI 2.2 5: fullsize, 32-bit 33MHz, PCI 2.2 6: Mini PCI type III - FireWire (sc fullsize, AGP 8X (1.5v) sed by std AGP graphics adapte	vid (5v) (5v) (5v) (6v) (esv)	nternal disk capacity <sup>13</sup> : B (4 disks x 73.4GB) B (3 disks x 80GB) left side panel n/Setup Utility: F1 at startup covery Program: F11 at Utility: CTRL+A at startup ot: F12 at startup	<ul> <li>Diskette boot inhibit an</li> <li>Disable mouse</li> <li>Diskette, disk, serial poli/O control</li> </ul>	nd write-protect ort, parallel port gs JM ol for EEPROM
	* on 256MB PC2100 CL	two-slot extender board  2.5 ECC DDR-SDRAM  10K	Adv Config F     DMI 2.2-com	Power Interface (ACPI) 1.0a pliant	⇒ 3 year parts and lab  ⇒ International Warren  → I	or
	1GB PC2100 CL2.9 IBM 36.4GB 15K rp IBM 36.4GB 10K rp IBM 73.4GB 10K rp IBM 80GB 7.2K rpr IBM 4Ux20D Towe IBM P97 19" (18.0° IBM T750 17" Flat I	5 ECC DDR-SDRAM DIMM 10K 0m Ultra160 SCSI HDD 06P 0m Ultra320 SCSI HDD 32P 0m Ultra320 SCSI HDD 32P 0m ATA-100 EIDE HDD 09N 0r-to-Rack Conversion Kit 1 v.i.s.) Monitor (black) 655	0071   Microsoft® Wi 0723 - Free license 0724 + Free license 0724 + Pree license 0725 + Pree license 0726 + Pree license 0727 + Pree license 0727 + Pree license 0727 + Pree license 0727 + Pree license 0728 + Pree license 0729 + Pree license 0729 + Pree license 0729 + Pree license 0730 + Pree license 0740 +	Windows XP Professional andows XP Professional efor Lotus SmartSuite efor Lotus Notes Client ers and IBM Enhanced CD tation Documentation CD Recovery (in service	<ul> <li>On site, 8 am through Mon through Fri exc next business day re on site warranty se options? available a options at ibm.com/source/wamomxeu.</li> <li>24x714 toll-free supp issues during the warranty seconds.</li> </ul>	gh 5 pm, cluding holidays, esponse time ervice upgrade as ServicePac services/its/us/ pdf port for warranty

See footnotes for important warranty information US models announced November 19, 2002

	1011 111110	, ,	11 2000			Tield Skills Ellablement Team
IBM® Type-model Processo	FSB or GHz¹ MHz Mem	nory Disk and rpm	Disk controllers	Graphics add Optical and memo		Slots x Available bays FireWire Preload <sup>17</sup> date
6219-23U Pentium 6219-27U Pentium 6219-34U Pentium 6219-35U Pentium 6219-38U Pentium 6219-39U Pentium 6219-45U Pentium	4 2.67 533 512 4 2.67 533 512 4 2.8 533 512 4 2.8 533 1GE 4 2.8 533 512 4 2.8 533 1GE 4 3.06 533 1GE 4 3.06 533 1GE 4 3.06 533 1GE	MB 40.0GB EIDE 7.2 MB 36.4GB U320 10	ek eide K ultra320, eide	CD-RW Quadro4™ 580XGL CD-RW Quadro4 980XGL CD-RW Quadro4 580XGL CD-RW Quadro FX 1000 CD-RW Quadro4 980XGL CD-RW Wildcat 4™ 7110 CD-RW Quadro FX 1000 CD-RW Quadro4 980XGL CD-RW Wildcat 4 7110 2	GL 64MB 128MB 64MB 128MB 128MB 128MB 256MB 128MB 128MB 56MB	B 6x7 1394 XP Pro Mar 2003 6x7 1394 XP Pro Apr 2003 6x7 1394 XP Pro Mar 2003
	No SMP Suppo Motherboard co	ort / 512KB std and ontains one mPGA47	max / at process BB socket (proces	or speed	), four DII	MM sockets, one 8X AGP slot,
Memory - std / max Memory - features	DDR-SDRAM	DIMMs / four DIMM g	old-connector slot	ts on systemboard / DIMMs	s must be	nbuffered 184-pin ECC CL2.5 installed in matched pairs [a DIMMs and memory controller
Graphics controller (one of following)	NVIDIA Quad dual 350MHz     NVIDIA Quad RAMDACs / du     3DLabs Wild 128MB texture two DVI-I con     NVIDIA Quad	dro4™ 580XGL (entry RAMDACs / dual he dro4 980XGL (advan ual head: 2048x1536s (cat4™ 7110 (extreme e buffer) / dual RAMDA nectors (ships with tw dro FX 1000 (advance	/ 3D) / ÁGP 8X ad: 2048x1536x1 ced 3D) / AGP 8 k16M each monit 3D) / AGP 8X P kC [320/280MHz], b DVI-I to analog ed 3D) / AGP 8X	6M each monitor / LFH60 X adapter / 128MB 325Mb or / two DVI-I connectors ro 50 adapter / 256MB tota / dual head support (up to tw DB-15 adapters for analog	conn. inc Iz DDR-S (ships with al DDR-SE o digital or monitor a DDR-SDR	h two DVI-I to DB-15 dongles) DRAM (128MB frame buffer, analog monitors) / ttachment) AM / dual 400Mhz RAMDACs /
	r <i>SCSI models: l</i>	Adaptec® AIC-7901	/ single channel / / one 68-pin inter	O Controller Hub 4 / two of Ultra320 SCSI controller hal connector on extender by	(LVD 320	MB/sec) / on extender board /
Cables	EIDE models:	Two EIDE cables (one	e 2-drop cáble to (	CD-ROM, one 2-drop cable ble from extender to int disk		lisk) ne 2-drop EIDE cable (to optical)
Disk - features	Some: 40.0GB	EIDE / ATA-100 / 720	0 rpm / 9.0 ms se			0K rpm / 4.7 ms; <i>All:</i> S.M.A.R.T. <sup>5</sup>
Rack support Chipset	Intel E7205 chi bus (five slots a		emory Controller I			ontroller Hub (ICH4) for PCI 2.2 B, Low Pin Count Interface /
Gigabit ethernet  Diskette drive Optical drive IEEE 1394 (FireWire Audio Rear ports Front ports Systems mgmt	chip on planar / 3.5" 1.44MB dis One of followin ) Some: FireWire Soft audio AC 'S Two USB (Ver 2 Two USB (Ver 2	PCI-X 64-bit 100MHz skette drive og: 48X/24X/48X/16X e controller in Mini PC 97 v2.2 interface via IC 2.0), two 9-pin serial, p 2.0), audio line out (ste	(limited to PCI 2.2 Max <sup>6,19</sup> CD-RW/E CI slot / 1394A, 40 CH4 (AD1885) / in parallel, keyboard ereo), mic in / son	32-bit 33MHz) / full duplex ov DVD-ROM Combo, or 48X/00Mbps, 6-pin port on rear ternal speaker (use of audi	Wake on 24X/48X I 4-pin po b line out r e in, audic	ort on front requires powered speakers) b line out, mic in / some: 6-pin 1394 SECURITY
Keyboard / mouse Cooling fans Power supply	Three variable s		r, rear, processor)	nouse (6-pin PS/2 conn) / not redundant or hot-swap d surge protection	optional • Security	Inchoring feature (U-bolt is I; supports optional padlock) y slot (for attachment of optional ick such as Kensington cable lock)
Optical Bay Bay Bay Bay Bay Bay Bay Bay	① 5.25", HH 1.6" ② 5.25", HH 1.6" ③ 3.5", SL 1", ④ 3.5", SL 1", ⑤ 3.5", SL 1", ⑥ 3.5", SL 1", ⑦ 3.5", SL 1",	".access. open	rotates out of  ⇒ Two front stat  ⇒ Handle grip o  ⇒ H 17.375" x V  ⇒ H 441mm x V	oilizing feet n top	<ul><li>Side co</li><li>Cover ta</li><li>Secure</li><li>Power-o</li><li>Adminis</li><li>Keyboa</li><li>Boot see</li></ul>	ver key lock amper detect switch fixed DASD on password strator password rd/mouse password quence control
Mini-tower Stealth black Slot	I/A on models wi 2: fullsize, 32-bit 3: fullsize, 32-bit 4: fullsize, 32-bit 5: fullsize, 32-bit 6: Mini PCI type fullsize, AGP sed by std AGP	graphics adapter	SCSI: 282GB EIDE: 320GB Removable le Configuration Product Reco	/Setup Utility: F1 at startup very Program: F11 at tility: CTRL+A at startup	<ul> <li>Diskette</li> <li>Disable</li> <li>Diskette</li> <li>I/O cont</li> <li>Secure</li> <li>VPD sto</li> <li>Write pr</li> </ul>	e, disk, serial port, parallel port trol access openings ored in EEPROM rotection control for EEPROM curity Solutions
256MB PC2100 CI 512MB PC2100 CI	2.5 ECC DDR-S	SDRAM 10K0067 SDRAM 10K0069	Adv Config Po     DMI 2.2-comp	ower Interface (ACPI) 1.0a	Intern	LIMITED WARRANTY <sup>3</sup> r parts and labor lational Warranty Service <sup>3</sup> te, 8 am through 5 pm,
	pm Ultra160 SC; pm Ultra320 SC; pm Ultra320 SC; m ATA-100 EIDH ver-to-Rack Con .200P 20.1inLCI CD Black Digita	SI HDD 06P5766 SI HDD 32P0723 SI HDD 32P0724 E HDD 09N4226 IVersion Kit 09N4300 D Black A/D 6736-HB0 J 9503-DG3	Microsoft® Wind - Free license f - Free license f > Device Driver Diagnostics C > IBM IntelliSta	lows® XP Professional or Lotus® SmartSuite® for Lotus Notes® Client as and IBM Enhanced	Mon t next k → On si option option sourc → 24x712	te, o an titrough s pin, hrough Fri excluding holidays, business day response time te warranty service upgrade ns <sup>7</sup> available as ServicePac ns at ibm.com/services/its/us/ te/wamomxeu.pdf toll-free support for warranty s during the warranty period
See footnotes for imp	ortant warranty in	nformation				(6219) © IBM Corp. November 2002

(6221) © IBM Corp. November 2002

	IBM®	FSB		Disk	Graphics adapt	ter Slots x	Available			
× ×	6221-22U 1 x Xeon	1 <sup>TM</sup> 2.4 533 512MB 2.67 533 512MB 2.67 533 512MB 2.8 533 512MB 2.8 533 1GB	40.0GB EIDE 7.2k 36.4GB U320 10K 36.4GB U320 10K 36.4GB U320 10K	KUltra320, EIDE CD Ultra320, EIDE Combo	Quadro4 280NVS 64N Quadro4 980XGL 128	/I-I 32MB6x6	Preload			
	L2 cache Processor upgrade	<b>512KB</b> std and max <b>2-way SMP</b> / up to systemboard conta	x / at processor spe two Xeon Processo ins two Intel 604-p	ors (same speed/cache siz	ze)	ts, seven slots (one PCI 2.2, four PCI-X,				
		SDRAM DIMMs / fo 2-way memory inte	our DIMM gold-con rleave / dual chan	slots used / two slots ava- nector slots on systembo- nel / <b>Error Checking and</b> me chip and detects 2- th	ard / DIMMs must be d Correcting (ECC)	e installed in matched via <b>16-bit Checksum</b>	pairs [a bank] /			
	(one of following)	dual RAMDAC [36  • NVIDIA™ Quadro 350MHz RAMDAC  • NVIDIA Quadro4  • NVIDIA Quadro4  3DLabs Wildcat4 128MB texture but	60/232MHz] / duàl h 14 280NVS (high-pe Cs / dual head: 2048 980XGL (advance 1536x16M each mo TM 7110 (extreme 3) ffer) / dual RAMDAO	try 2D) / AGP 4X adapter / ead support / one DVI-I con trf 2D) / AGP 8X adapter / I 8x1536x16M each monitor dd 3D) / AGP 8X adapter / onitor / two DVI-I connecto D) / AGP 8X Pro 50 adapte C [320/280MHz] / dual hea VI-I to analog DB-15 adapte	nnector (ships with one NV18LT 275MHz GPU / LFH60 connector for 128MB 325MHz DDF ors (ships with two DV or / 256MB total DDR-td support (up to two di	e cable with two DB-15 a J / 64MB 200MHz DDF of std cable with two DB-1 B-SDRAM / dual 350Ml II-I to DB-15 dongles) SDRAM (128MB frame Igital or analog monitors	analog conns) R-SDRAM / dual 15 analog Hz RAMDACs / buffer,			
	SCSI disk controller	LSI Logic® 53C103 supports RAID-1 m Two 16-bit channels systemboard to into systemboard to rea EIDE models: Two SCSI models: One	80 / dual channel L irroring (Embedde s (one internal and ernal disks bays; E. r external 68-pin co EIDE cables (one or two SCSI cable	integrated in I/O Controller Iltra320 SCSI controller Id Mirroring) one external / Internal chaternal channel: Models 2 innector (cable available a 2-drop cable to CD-ROM, s (listed above), one 2-drop rpm / 9.0 ms seek; Some	(LVD 320MB/sec) / or annel: one 3-drop 16- 90U/37U have one 1-dus option part number one 2-drop cable to op EIDE cable (to opti	n planar / 64-bit 100Ml -bit 68-pin LVD SCSI ca lorop 16-bit 68-pin LVD ( 24P7929) EIDE disk) (cal)	able from SCSI cable from			
	Rack support Chipset	4U <sup>4</sup> rack mount su Intel E7505 chipse for slots 2 and 3 and	pport via tower-to-i t / E7505 MCH (Me d ethernet controller	<u> </u>	GP 8X slot, P64H2, IOnd SCSI controller) / I/	CH4 / P64H2 for two P0 O Controller Hub (ICH4	CI-X buses (Bus A 4) for PCI 2.2 bus			
	Diskette drive Optical drive IEEE 1394 (FireWire) Audio Rear ports Front ports	chip on planar / PCI 3.5" 1.44MB diskett One of following: 48 )Some: FireWire co Soft audio AC '97 v: Two USB (Ver 2.0), Two USB (Ver 2.0),	-X 64-bit 100MHz / e drive 8X-20X <sup>6</sup> CD-ROM, ntroller in Mini PCl 2.2 interface via ICl two 9-pin serial, pa audio line out (ster	roller / Broadcom BCM570 full duplex / Wake on LAN' 32X/10X/40X/16X Max <sup>6,19</sup> I slot / 1394A, 400Mbps, H4 (AD1885) / internal spearallel, keyboard, mouse, reo), mic in / some: 4-pin 1 s, and voltage faults / Wint	Alert Standard Forr CD-RW/DVD-ROM C 6-pin port on rear, 4- eaker (use of audio lire ethernet, audio line in 1394 FireWire pond® W791D	mat 1.0 / one rear RJ-48 combo, or 40X/24X/40X -pin port on front, no come out requires powere a, audio line out, mic in/ SECURI	5 port  ( Max <sup>6</sup> CD-RW cables included d speakers)  / some: 6-pin 1394			
	Keyboard / mouse Cooling fans Power supply	IBM 104-key keyboo Three variable spee 425 watts / universa	ard (6-pin PS/2) / IB d fans (power supp I / auto sensing / bu	M three button mouse (6-p ly, two in rear) / not redund ilt-in overload and surge p	oin PS/2 conn) lant or hot-swap rotection	J-bolt anchoring feature ptional; supports optior Security slot (for attachn able lock such as Kens	e (U-bolt is nal padlock) nent of optional			
	Optical Bay	<ul> <li>3.5", SL 1", no</li> <li>3.5", SL 1", no</li> <li>3.5", SL 1", no</li> <li>3.5", SL 1", no</li> <li>1: fullsize, 32-bit 33 No</li> <li>4: fullsize, 64-bit 100</li> <li>4: fullsize, 64-bit 100</li> <li>5: fullsize, 64-bit 100</li> <li>6: Mini PCI type III -</li></ul>	cess, open cess, diskette access, disk access, open access, open MHz, PCI 2.2 (5v) Vildcat4 7110 vid MHz, PCI-X 1.0 MHz, PCI-X 1.0* MHz, PCI-X 1.0* MHz, PCI-X 1.0 FireWire (some) (1.5v) aphics adapter	<ul> <li>Metal cage for disk bay rotates out of chassis</li> <li>Two front stabilizing fee</li> <li>Handle grip on top</li> <li>H 17.375" x W 6.5" x D</li> <li>H 441mm x W 165mm</li> <li>36 lb to 45.8 lb (16.3kg</li> <li>Maximum internal disk SCSI: 438GB (3 disks &gt; EIDE: 360GB (3 disks &gt; EID</li></ul>	19.375"	Cover key lock Cover tamper detect sw Secure fixed DASD Power-on password Administrator password Keyboard/mouse password Boot sequence control Boot without keyboard o Diskette boot inhibit and Disable mouse Diskette, disk, serial por Co control Becure access openings PD stored in EEPRON Vrite protection control BM Security Solutions  LIMITED WARF	ord or mouse write-protect t, parallel port s for EEPROM			
	Xeon 2.67GHz/512 Xeon 2.8GHz/512h 256MB PC2100 CL 512MB PC2100 CL 1GB PC2100 CL2.9 2GB PC2100 CL2.9 IBM 73.4GB 15K rp IBM 146GB 10K rp IBM 120GB 7.2K rp IBM 4Ux20D Towe	2KB L2 Cache Proc U CAS L2 Cache Proc U L2.5 ECC DDR-SDR, L2.5 ECC DDR-SDRAN DE	Dpgrade 59P5109 pgrade 59P5110 AM x4 33L5037 AM x4 33L5038 1DIMM 33L5039 1DIMM 33L5040 DD 32P0733 DD 32P0725 IDD 09N4231 on Kit 09N4300	DMI 2.2-compliant  Preload with Windows XP     Free license for Lotus     Free license for Lotus     Device Drivers and IBM Diagnostics CD     IBM IntelliStation Docur     Disk-to-Disk Recovery partition)	XP Professional <sup>17</sup> Professional SmartSuite® Notes® Client I Enhanced mentation CD	Mon through Fri excluding holiday next business day response time  On site warranty service upgradu options available as ServicePac options at ibm.com/services/its/us source/wamomxeu.pdf				

	IBM® Type-model Processo	FSB or GHz1 MHz Memory	Disk and rpm	Disk controllers Optical	Graphics adapte and memory	r Slots x bays FireWire		ailable date			
<b>a</b>	6221-38U 1 x Xeor 6221-40U 1 x Xeon 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 L2 cache	™2.8B533 1GB 3.06 533 512MB 3.06 533 512MB 3.06 533 1GB 3.06 533 1GB 3.06 533 1GB 3.06 533 1GB 3.06 533 1GB 3.06 533 1GB 3.06 533 512MB 1 or 2 x Intel® Xeo 512KB std and max	36.4GB² U320 101 40.0GB EIDE 7.2h 40.0GB EIDE 7.2h 36.4GB U320 10k 36.4GB U320 10k 36.4GB U320 10k 36.4GB U320 10k (none) open-bay n at 2.8B or 3.06 x/at processor spe	KUltra320, EIDE CD-RW KUltra320, EIDE CD KUltra320, EIDE CD KUltra320, EIDE COMbo KUltra320, EIDE CD-RW KUltra320, EIDE COMbo KUltra320, EIDE COMbo KUltra320, EIDE DVD KULTRA320, EIDE None	Quadro4 980XGL 128 Millennium G450 DVI Quadro4 280NVS 64N Quadro4 980XGL 128 Wildcat4 7110 256ME Quadro FX 1000 128N Quadro4 280NVS 64N Quadro4 280NVS 64N Side bus (FSB)	MB 6x6 1394 -I 32MB6x6 MB 6x6 MB 6x6 1394 B 6x6 1394 MB 6x6 1394 MB 6x6 1394	XP Pro Api XP Pro Api XP Pro Api XP Pro Api XP Pro Api XP Pro Api	r 2003 r 2003 r 2003 r 2003 r 2003 r 2003 r 2003			
	Implementation	Systemboard conta one Mini PCI, one	ins two Intel 604-pi 8X AGP), and inte	n micro-PGA2 ZIF socke grated SCSI and etherne slots used / two slots av	ts, four DIMM slots, sev t						
	Memory - features	SDRAM DIMMs / fo 2-way memory inter (corrects 1, 2, 3, or 4	our DIMM gold-con leave / dual channe 4-bit errors on same	nnector slots on systemboard / DIMMs must be installed in matched pairs [a bank] nel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ ne chip and detects 2- through 8-bit errors contained in two chips)							
	Graphics controller (one of following)	<ul> <li>NVIDIA™ Quadro</li> <li>NVIDIA Quadro4</li> <li>RAMDACs / dual r</li> <li>3DLabs Wildcat4</li> <li>128MB texture buttwo DVI-I connect</li> <li>NVIDIA Quadro I</li> </ul>	p4 280NVS (high p 980XGL (advance pa 2048x1536x1 pa 7110 (extreme a pa 1100 (extreme and pa pa 11000 (advanced pa 11000 (advanced	ntry 2D) (see 6221-Nove performance 2D) (see 62 ed 3D) / AGP 8X adapte 16M each monitor / two 3D) / AGP 8X adapter / 2 C [320/280MHz] / dual hea DVI-I to analog DB-15 ad 3 3D) / AGP 8X adapter / onitor / two DVI-I connec	21-November 2002 sh or / 128MB 325MHz D DVI-I connectors (ship 256MB total DDR-SDR d support (up to two dig dapters for analog mon 128MB 800Mhz DDR	eet for specs) DR-SDRAM / dual s with two DVI-I to AM (128MB frame I ital or analog monitor itor attachment) -SDRAM / dual 400	DB-15 dong buffer, s)/ Mhz RAMD				
	SCSI disk controller	LSI Logic® 53C10: supports RAID-1 r Two 16-bit channe systemboard to inte systemboard to rea EIDE models: Two	30 / dual channel nirroring (Embedo ls (one internal and rnal disks bays; E. r external 68-pin co	/ integrated in I/O Contr Ultra320 SCSI controll ded Mirroring) d one external) / Internal xternal channel: Models 2 nnector (cable available a 2-drop cable to CD-ROM s (listed above), one 2-dro	er (LVD 320MB/sec) / channel: one 3-drop - 9U/37U have one 1-dreas option part number 2 , one 2-drop cable to E	on planar / 64-bit 16-bit 68-pin LVD S pp 16-bit 68-pin LVD 4P7929) IDE disk)	CSI cable f	rom			
	Disk - features	Some: 40.0GB EIDI	E / ATA-100 / 7200	rpm / 9.0 ms seek; Som	e: 36.4GB Ultra320 SC	SI / 10K rpm / 4.7 m	s: <i>All:</i> S.M.	A.R.T.⁵			
	Rack support Chipset	4U <sup>4</sup> rack mount su Intel E7505 chipset A for slots 2 and 3 au	pport via tower-to-r / E7505 MCH (Mem nd ethernet controlle	•	P 8X slot, P64H2, ICH4 nd SCSI controller) / I/O	/ P64H2 for two 64-b Controller Hub (ICH4	it PCI-X buse ) for PCI 2.2	es (Bus			
	Audio Rear ports	chip on planar / PCI 3.5" 1.44MB disket Combo, 48X/24X/4. Some: FireWire co Soft audio AC '97 v Two USB (Ver 2.0), Two USB (Ver 2.0)	-X 64-bit 100MHz / te drive and one c 8X Max <sup>6</sup> CD-RW o ntroller in Mini PCI 2.2 interface via IC two 9-pin serial, pa , audio line out (st	roller / Broadcom BCM570 full duplex / Wake on LAN if the following: 48X-20X r 16X Max <sup>6</sup> DVD-ROM slot / 1394A, 400Mbps, H4 (AD1885) / internal sp irallel, keyboard, mouse, dereo), mic in / some: 4-ps, and voltage faults / Win	<ul> <li>Alert Standard Form</li> <li>CD-ROM, 48X/24X/4</li> <li>6-pin port on rear, 4-peaker (use of audio line)</li> <li>athernet, audio line in, a pin 1394 FireWire</li> </ul>	at 1.0 / one rear RJ-4 3X/16X Max <sup>6,19</sup> CD-I in port on front e out requires powel	45 port RW/DVD-R0 red speakers / some: 6-pi	s)			
	Keyboard / mouse Cooling fans Power supply	Three variable spee	d fans (power supp	M three button mouse (6- ly, two in rear) / not redund ilt-in overload and surge p	oin PS/2 conn) lant or hot-swap rotection op Se ca	tional; supports optic curity slot (for attach ble lock such as Ken	nal padlock) ment of opti	onal			
	Optical Bay	<ul> <li>3.5", SL 1", no</li> <li>3.5", SL 1", no</li> <li>3.5", SL 1", no</li> <li>1: fullsize, 32-bit 33N</li> </ul>	cess, open cess, diskette access, disk access, open access, open MHz, PCI 2.2 (5v)	<ul> <li>Metal cage for disk bay rotates out of chassis</li> <li>Two front stabilizing fe</li> <li>Handle grip on top</li> <li>H 17.375" x W 6.5" x E</li> <li>H 441mm x W 165mm</li> <li>36 lb to 45.8 lb (16.3kg</li> </ul>	et	over key lock over tamper detect so cure fixed DASD wer-on password ministrator password yboard/mouse pass ot sequence control ot without keyboard	d word				
	Mini-tower Raven black Slot Slot Slot Slot Slot - 1	J/A on models with V 2: fullsize, 64-bit 100 3: fullsize, 64-bit 100 4: fullsize, 64-bit 100 5: fullsize, 64-bit 100 6: Mini PCI type III - fullsize, AGP 8X used by std AGP gratended slot	MHz, PCI-X 1.0 MHz, PCI-X 1.0 MHz, PCI-X 1.0* MHz, PCI-X 1.0 FireWire (some) (1.5v)	<ul> <li>Maximum internal disk SCSI: 438GB (3 disks EIDE: 360GB (3 disks</li> <li>Removable left side pa</li> <li>BIOS Setup Utility via I</li> <li>LSI Configuration Utilit pressing CTRL+C</li> <li>Product Recovery Prog startup</li> </ul>	x 146GB) x 120GB) nel =1 at startup y near startup by	skette boot inhibit and sable mouse sable mouse skette, disk, serial pool control cure access opening D stored in EEPRO it protection control M Security Solutions	ort, parallel p gs M I for EEPRO	ort			
	Xeon 3.06GHz/512k 512MB PC2100 CL2.5 1GB PC2100 CL2.5 2GB PC2100 CL2.5 IBM 73.4GB 15K rp IBM 146GB 10K rp IBM 120GB 7.2K r IBM ThinkVision L IBM T221 22.2inLG IBM 4Ux20D Tow	er-to-Rack Čonvers ibm.com/pc/us/acc	ograde 24P8123 RAM x4 33L5038 1DIMM 33L5039 1DIMM 33L5040 DD 32P0733 DD 32P0725 HDD 09N4231 ack A/D 6736-HB0 9503-DG3 sion Kit 09N4300 bessories	Diagnostics CD	XP Professional <sup>17</sup> Professional SmartSuite® Notes® Client I Enhanced  mentation CD (in service	LIMITED WAF B year parts and laboraternational Warran On site, 8 am throug Mon through Fri exc next business day re on site warranty se options <sup>7</sup> available a options at ibm.com/s source/wamomxeu.p 24x7 <sup>14</sup> toll-free supp ssues during the wa	or ty Service <sup>3</sup> h 5 pm, luding holid sponse time rvice upgra s ServiceP, services/its/ off ort for warr. urranty perio	e ide ac us/ anty			

Z @ 502 702	жост.ос							жиш. Бу	000.10.	i ioid Oiline		one roun
IBM® Type-model Processo	L2 r GHz¹ cache	FSB MHz	Memory	Disl	k	Disk controll		Extender pard controllers		Hot-swap disk bays		Available date
× 8480-93X Celeron® 8480-94X Celeron	1.8 128KB 1.8 128KB	400 400	256MB 128MB	40GB <sup>2</sup> EID 40GB EIDI	E 7200 rp E 7200 rpi	m EIDE m EIDE		Graphics Graphics	5 x 7 5 x 7	None (fixed None (fixed		Dec 2002 Feb 2003
Positioning Processor(s) L2 cache Implementation SMP support	Intel® Celero 128KB std ar Motherboard	nd mai nd mai conta t, ether	.8GHz w x / ECC / ins one n rnet cont	<b>ith 400MHz</b> full speed nPGA478 sc roller, conne	frontside ocket (prodector for ex	<b>bus</b> (FS cessor/L2	SB) 2 cache i	n FC-PGA2), to DPCI slots and	wo DIMN	l sockets, th	ree PCI slo	ts,
Memory	256MB / 2GI PC2100 266I industry std /	MHz E	CC DDR	R-SDRAM / E	Error Che	cking an	kets / or d Corre	ne socket used cting (ECC) D	l / IMMs an	d ECC mem	ory control	ler/
SCSI disk controller IDE disk controller Cables Disk		E/AT	ables (o	ne čable use	es one dro	p to CD-	ROM, o	nnectors on pla ther cable uses M.A.R.T.		op to disk)		
Rack support Bus slots (see below Chipset	One PCI bus Intel 845E ch 82801DB I/O	ck mount support via tower-to-rack kit option CI bus / five 32-bit 33MHz PCI 2.2 slots / one AGP 4X slot (not used) / no hot-swap Active™ PCI slots 45E chipset / 82845E Memory Controller Hub (MCH) / DB I/O Controller Hub (ICH4) for PCI 2.2 bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / are Hub / SMSC® LPC47M102 Super I/O for diskette, parallel, serial, keyboard, mouse										
Ethernet  CD-ROM / diskette Ports  Diagnostics Systems mgmt cntrl	Preboot eXec CD-ROM: 48 Front: none; monitor (anal Diagnostic L Winbond® W	100/1000 gigabit / Broadcom® BCM 5702 or 5705 / on planar / PCI 2.2 32-bit 33MHz / full duplex / PHY and MAC layers / boot eXecution Environment (PXE) / Wake on LAN® / Alert Standard Format 1.0 -ROM: 48X-20X® CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive nt: none; Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), nitor (analog DB-15), microphone-in (mono), line-in (stereo), line-out (stereo) gnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD ibond® W83791 / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / port for optional Remote Supervisor Adapter (provides continuous health monitoring and control)										
Graphics controller	SVGA / ATI®	Rage	eXL / on	extender be	oard / 4MI	B SDRAI	M std/m	ax / PCI 2.2 3	2-bit 33N	/IHz / analog	g 15-pin D	-Sub conn
Security	Mechanical s via knockout control / oper cover tamper	/ pow ration	er-on pas without k	ssword / boo	ot sequend		512ME 1GB P IBM 80	B PC2100 CL2. B PC2100 CL2. C2100 CL2.5 E DGB 7200 rpm	.5 ECC DDI ECC DDI EIDE AT	DR UDIMN R UDIMM A-100 HDD	<b>!</b>	10K0067 10K0069 10K0071 09N4226
Software		nd cor	nfiguratio	n tool), IBM	Director		IBM Re		sor Adap o-Rack ł	iter (PČI ada Kit	apter)	22P6976 09N7585 09N4300 19K4646
Keyboard / mouse Cooling fans	Three fans (fant) not redundar 340 watts / un Automatic Se	IBM 4Ux20D Tower-to-Rack Kit 09N4300										
									-> 1 was:	LIMITED W		<b>'Y</b> 3

Slot 1: fullsize, 32-bit 33MHz, PCI 2.2 (5v) Slot 2: dulsize, 32-bit 33MHz, PCI 2.2 (5v) Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v) Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)\*\* Slot 5: fullsize, 32-bit 33MHz, PCI 2.2 (5v)\*\* Slot: fullsize, 32-bit AGP 4X (1.5 \*\* on two-slot PCI extender board fullsize, 32-bit AGP 4X (1.5v)

CD-ROM 2 diskette 4 **6** disk 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 3.5", SL 1", access, open
Bay ⑤ 3.5", SL 1", access, open
Bay ⑥ 3.5", SL 1", access, open
Bay ⑥ 3.5", SL 1", access, open
Bay ⑥ 3.5", SL 1", access, open
Bay ⑦ 3.5", SL 1", access, open access, std disk (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

♦ 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
- ♦ Handle grip on top
   ♦ H 18.5" x W 6.5" x D 20.0"
   ♦ H 470mm x W 165mm x D 508mm
- 35 to 42 pounds (15.9 to 19.1kg)

Maximum internal IDE disk capacity:

- 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)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

240GB13 (3 disks x 80GB)

	BM® Type-model Processor	L: GHz¹ cac		Memory	Disk	(	Disk controll	Extender er board controll	PCI slots ers x bays	s Hot-swap disk bays	Ethernet	Available date	
< < <	3480-13X Pentium® 4 3480-22X Pentium 4 3480-2AX Pentium 4 3480-23X Pentium 4 3480-32X Pentium 4 3480-3AX Pentium 4 3480-33X Pentium 4	2.0 512 2.0 512 2.0 512 2.4 512 2.4 512	2KB 400 2KB 400 2KB 400 2KB 400 2KB 533 2KB 533 2KB 533	256MB 256MB 256MB 256MB 256MB	40GB EIDE 36.4GB Ultr	ra160 10K 7200 rpm ra160 10K	Ultra16 Ultra16 EIDE Ultra16 Ultra16	0 Graphics, SC Graphics 0 Graphics, SC	SI 5 x 7 5 x 7 SI 5 x 7	None (fixed) None (fixed) 3 hot-swap None (fixed) None (fixed) 3 hot-swap None (fixed)	Gigabit Gigabit Gigabit Gigabit Gigabit	Aug 2002 Aug 2002 Aug 2002 Aug 2002 Aug 2002 Aug 2002 Aug 2002	
	Positioning Processor(s) .2 cache mplementation GMP support	Intel® Per 512KB st Motherbo AGP slot,	ntium 4 a td and ma pard conta , ethernet	it 1.8, 2.0, ix / ECC / ains one n controller	, <b>or 2.4GHz</b> v full speed nPGA478 so	with 400 or cket (proce for extende	r <b>533M</b> H essor/L2	value and availabilit Iz frontside bus (F. cache in FC-PGA2 (two PCI slots, grap	ŚB) ), two DIMM	1 sockets, three	e PCI slot	s, one	
	Memory	PC2100 2	MB / 2GB <sup>13</sup> max / two 184-pin gold-plated DIMM sockets / one socket used / 2100 266MHz ECC DDR-SDRAM / Error Checking and Correcting (ECC) DIMMs and ECC memory controller / stry std / unbuffered / CAS Latency 2.5 (CL2.5)										
	SCSI disk controller SCSI connectors DE disk controller Cables	board / 32 Enhance SCSI fixe SCSI hot EIDE mo Some SC	St models: Adaptec® AHA-7892 / single channel Ultra160 SCSI controller (160MB/sec) / controller on extender rd / 32-bit 33MHz PCI 2.1 / one 68-pin internal connector on extender board / no external SCSI connector anced IDE / ATA-100 / integrated in I/O Controller Hub / two connectors on planar St fixed disk models: one 5-drop 16-bit LVD SCSI cable, one 2-drop EIDE cable St hot-swap models: one 1-drop 16-bit LVD SCSI cable (extender board to SCSI backplane), one 2-drop EIDE cable two 2-drop EIDE cables (one cable uses one drop to CD-ROM, other cable uses one drop to disk) 18.2GB or 36.4GB / Ultra160 SCSI / 10000 rpm / 5.2 ms read seek / S.M.A.R.T.5 40GB EIDE / ATA-100 / 7200 rpm / 9.0 ms read seek / S.M.A.R.T.										
	Rack support Bus slots (see below) Chipset	One PCI Intel 845 82801DB	rack mount support via tower-to-rack kit option PCI bus / five 32-bit 33MHz PCI 2.2 slots / one AGP 4X slot (not used) / no hot-swap Active™ PCI slots 845E chipset / 82845E Memory Controller Hub (MCH) / I1DB I/O Controller Hub (ICH4) for PCI 2.2 bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / ware Hub / SMSC® LPC47M102 Super I/O for diskette, parallel, serial, keyboard, mouse										
	Ethernet CD-ROM / diskette Ports Diagnostics Systems mgmt cntrl	Preboot e CD-ROM Front: (no monitor (a Diagnost Winbond	/100/1000 gigabit / Broadcom® BCM 5702 / on planar / PCI 2.2 32-bit 33MHz / full duplex / PHY and MAC layers / eboot eXecution Environment (PXE) / Wake on LAN® / Alert Standard Format 1.0 b-ROM: 48X-20X® CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive ont: (none); Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), initor (analog DB-15), microphone-in (mono), line-in (stereo), line-out (stereo) agnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD nbond® W83791 / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / pport for optional Remote Supervisor Adapter (provides continuous health monitoring and control)										
	Graphics controller							// std/max / PCI 2.2			-	Sub conn	
	Security	Mechanic hot-swap power-or	cal side po models) n passwor	anel key l / optional rd / boot s	lock (locks h I U-Bolt supp equence con over tamper	ot-swap dis oort via kno ntrol / opera	sks on ckout / ation	256MB PC2100 C 512MB PC2100 C 1GB PC2100 CL2 IBM 80GB 7200 rp	L2.5 ECC [ L2.5 ECC [ .5 ECC DD om EIDE AT	DDR UDIMM DDR UDIMM R UDIMM FA-100 HDD	·	10K0067 10K0069 10K0071 09N4226	
	Software  Keyboard / mouse	installatio (system h	on and co hardware	nfiguratio mgmt sof	automated n n tool), IBM l ftware) and r I mouse (bot	Director many utilitie		IBM 36GB 15K Ulfr IBM 73.4GB 10K U IBM 36.4GB 10K U IBM 73.2GB 10K U 40X/12X/40X Max	Itra160 SCS Itra160 SCS JItra160 SC	SI SL HDÒ(not SI Hot-swap HI SSI Hot-swap I	hot-swap DD	)06P5752 06P5768 06P5756 22P6976	
	Cooling fans  Power supply	Fixed dist Hot-swap All: not r 340 watts Automatic	sk models. o models: redundant s / univers ic Server I	three fan four fans / not hot- al / auto s Restart (A	ıs (fansink, re s (fansink, two swap / full sp	ear, pwr sur o rear, pwr oeed t-swap /	supply)	IBM Multi Burner IBM Remote Supe IBM 4Ux20D Towe IBM ServeRAID-4L IBM T541 15" Flat IBM NetBAY11 Sta Other options at ib	er-to-Rack l x Ultra160 : Panel Colc andard Rac	Kit SCSI Controlle or Monitor (blac ck Cabinet	r ck)	22P6970 09N7585 09N4300 06P5740 9512AB1 9306110	
	CD-ROM   Bay 2   Bay 3   Bay 4   Bay 6   Bay 6   Bay 6   Bay 7     • 6   • disk   Day 6   Bay 7   Carron   Ca	oit 33MHz, oit 33MHz, oit 33MHz, oit 33MHz, ot AGP 4X (	PCI 2.2 (PCI	5v) 5v) 5v)** ess, CD-Fess, openess, openess, openess, openess, std dal cage for chassis for plane or versis on disheradminishes.	ROM (no disk) tette (some) r disk or easy vorking sk(s) with strator of	memory) i startup SCSISelec CTRL+A Adv Config Device Dri CD-ROMi Handle gri H 18.5" x \ H 470mm 35 to 42 pc	tion/Set nvoked ct near s g Power ivers an ncluded lizing fee p on top W 6.5" x x W 165 bunds (1	up Utility (in flash by pressing F1 at startup by pressing F1 at startup by pressing r Interface (ACPI) 1 d Diagnostics let D 20.0" Smm x D 508mm l5.9 to 19.1kg)  GCSI disk capacity <sup>13</sup> x 73.4GB)  IDE disk capacity <sup>13</sup>	Intern On sit Mon-F next b On sit optior 3 ye (Se 3 ye (Se 3 ye (Se 24x7 <sup>14</sup> issues	LIMITED WA parts and laborational Warran e, 8 am-5 pm, ri excluding h usiness day re e service upgr is (in eligible li par IOR 9x5, 4 rvicePac part nu par IOR 24x7, 4 rvicePac part nu par IOR 24x7, 2 rvicePac part nu par IOR 24x7, 2 rvicePac part nu par IOR 14x7, 2 rvicePac par IOR 14x7, 2 rvice	or ty Servic colidays, esponse t ade ocations) BD respo um 69P95 hr avg re um 69P95 hr avg re um 69P95 ort for we	e³ :ime :7 nse 09) sponse 510) esponse 11) esponse 12) arranty	

IBM® Type-model Processor		Disk Extender PCI slots Hot-swap Available ontroller board controllers x bays disk bays Ethernet date												
8480-43X Pentium 4 8480-52X Pentium 4 8480-5AX Pentium 4	2.67       512KB       533       256MB       None       UI         2.67       512KB       533       256MB       40GB       EIDE 7200 rpm       EI         2.8       512KB       533       256MB       36.4GB       Ultra160       10K       UI	Iltra160 Graphics, SCSI 5 x 7 3 hot-swap Gigabit Feb 2003   IDE Graphics 5 x 7 None (fixed) Gigabit Feb 2003   Iltra160 Graphics, SCSI 5 x 7 None (fixed) Gigabit Feb 2003   Iltra160 Graphics, SCSI 5 x 7 3 hot-swap Gigabit Feb 2003												
Positioning Processor(s) L2 cache Implementation SMP support	Intel® Pentium 4 at 2.67 or 2.8GHz with 533MHz to 512KB standard and maximum / ECC / full speed Systemboard contains one mPGA478 socket (processor slot, ethernet controller, connector for extender board (two SMP support / no processor upgrade	or/L2 cache in FC-PGA2), two DIMM sockets, three PCI slots, one AGP wo PCI slots, graphics controller, some have SCSI controller)												
Memory	<b>256MB</b> / 2GB <sup>13</sup> max / two 184-pin gold-plated DIMM <b>PC2100 266MHz ECC DDR-SDRAM</b> / <b>Error Checkin</b> industry std / unbuffered / CAS Latency 2.5 (CL2.5)	I sockets / one socket used / ng and Correcting (ECC) DIMMs and ECC memory controller /												
SCSI disk controller SCSI connectors IDE disk controller Cables Disk - features	e PCI bus / five 32-bit 33MHz PCI 2.2 slots / one AGP 4X slot (not used) / no hot-swap Active™ PCI slots													
Rack support Bus slots (see below) Chipset	4U <sup>4</sup> rack mount support via tower-to-rack kit option One PCI bus / five 32-bit 33MHz PCI 2.2 slots / one AC Intel 845E chipset / 82845E Memory Controller Hub (I 82801DB I/O Controller Hub (ICH4) for PCI 2.2 bus, A	GP 4X slot (not used) / no hot-swap Active™ PCI slots MCH) / TA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface /												
Ethernet  CD-ROM / diskette Ports  Diagnostics Systems mgmt cntrl	2801DB I/O Controller Hub (ICH4) for PCI 2.2 bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / rmware Hub / SMSC® LPC47M102 Super I/O for diskette, parallel, serial, keyboard, mouse  0/100/1000 gigabit / Broadcom® BCM 5702 / on planar / PCI 2.2 32-bit 33MHz / full duplex / PHY and MAC layers / reboot eXecution Environment (PXE) / Wake on LAN® / Alert Standard Format 1.0  D-ROM: 48X-20X6 CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive ront: (none); Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), onitor (analog DB-15), microphone-in (mono), line-in (stereo), line-out (stereo) iagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics C inbond® W83791 / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / upport for optional Remote Supervisor Adapter (provides continuous health monitoring and control)													
Graphics controller		DRAM std/max / PCI 2.2 32-bit 33MHz / analog 15-pin D-Sub conn												
Security	Mechanical side panel key lock (locks hot-swap disks hot-swap models) / optional U-Bolt support via knock power-on password / boot sequence control / operatic without keyboard/mouse / cover tamper detect switch	tout / 512MB PC2100 CL2.5 ECC DDR UDIMM 10K0069 1GB PC2100 CL2.5 ECC DDR UDIMM 10K0071 1BM 80GB 7200 rpm EIDE ATA-100 HDD 09N4226												
Software  Keyboard / mouse Cooling fans	ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities  IBM 101 key keyboard / IBM mouse (both black)  Fixed disk models: three fans (fansink, rear, pwr supply Hot-swap models: four fans (fansink, two rear, pwr supply not redundant / not hot-swap / full speed	IBM 36GB 15K Ultra160 SCSI SL HDD (not hot-swap) 06P5766   IBM 73.4GB 10K Ultra160 SCSI SL HDD(not hot-swap) 06P5752   IBM 36.4GB 10K Ultra160 SCSI Hot-swap HDD 06P5756   IBM 73.2GB 10K Ultra160 SCSI Hot-swap HDD 06P5756   40X/12X/40X Max <sup>6</sup> CD-RW internal (black) 22P6976   IBM Multi Burner 22P6970   IBM Remote Supervisor Adapter (PCI adapter) 09N7300   IBM 4Ux20D Tower-to-Rack Kit 09N4300   IBM ServeRAID-4Lx Ultra160 SCSI Controller 06P5740												
Power supply	340 watts / universal / auto switch / Automatic Server Restart (ASR) / not hot-swap / no redundancy / cooling fan in power supply (variable s	IBM T541 15" Flat Panel Color Monitor (black) 9512AB1												
Slot 3: fullsize, 32-b Slot 4: fullsize, 32-b Slot 5: fullsize, 32-b ** on two-slot PCI ex  CD-ROM Bay ② Bay ③ Bay ③ Bay ⑤ Bay ⑥ Bay	2-bit 33MHz, PCI 2.2 (5v)  \$\rightarrow\$ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup  2-bit 33MHz, PCI 2.2 (5v)**  3-bit AGP 4X (1.5v)  \$\rightarrow\$ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup  \$\rightarrow\$ 1 year parts and labor international Warranty Service\$  \$\rightarrow\$ CSISelect near startup by pressing CTRL+A  \$\rightarrow\$ On site, 8 am-5 pm, Mon-Fri excluding holidays													

IBM® Type-model Processor	L2 GHz <sup>1</sup> cache	FSB MHz Me	emory	Disk	Disk controlle		PCI slots x bays	Power supply number and type	Ethernet	Available date
8647-22X 1 x Xeon <sup>1</sup> 8647-2AX 1 x Xeon 8647-32X 1 x Xeon 8647-3AX 1 x Xeon 8647-3BX 1 x Xeon		400 25 400 51 533 25 533 51	66MB 36.4GE 2MB None ( 66MB 36.4GE 2MB None (	3² Ultra320 10 open) 3 Ultra320 10 open)	0K Ultra32 Ultra32	0 None (4 fixed) 0 6 hot-swap 0 None (4 fixed) 0 6 hot-swap	6 x 7 6 x 9	One fixed One fixed One fixed One fixed Two redundant	Gigabit Gigabit Gigabit Gigabit	Dec 2002 Dec 2002 Dec 2002 Dec 2002
Positioning Processor(s) SMP - L2 cache Implementation	2-way SMP / Systemboard	on at 2.0 on the contains	or 2.4B GHz Xeon Proce two Intel 604	with 400 or essors (same I-pin micro-P	<b>r 533MHz</b> 1 e speed/ca PGA ZIF so	frontside bus (FS iche size) / 512KB ockets, four DIMN , and integrated S	<b>3</b> ´std ar 1 slots, s	seven slots (one		
Memory	DDR-SDRAM bank] / 2-way	DIMMs / memory	four DIMM g interleave / d	old-connecto ual channel .	or slots on / <b>Error C</b> h	ots available / PC2 systemboard / DII necking and Corr nd detects 2- throu	MMs mu: <b>ecting (</b> l	st be installed in ECC) via 16-bit (	matched <b>Checksu</b>	pairs [a <b>m</b>
IDE disk controller SCSI disk controller	LSI Logic® 53 supports RAII RAID 0, 1, 1E	3C1030 / D-1 mirro , 5, 00, 10	dual channe oring (Embed 0, 1E0, 50 (in	el Ultra320 S Ided Mirrorin Istalled only i	SCSI cont ng) / share in Slot 4)	d with optional IE	B/sec) / BM Serve	on planar / 64-b eRAID™-5i Contr	oller for	low-cost
SCSI channels and cables Cables Disk - features	SCSI cable from backplane; Example SCSI call	om system external cha ble (listed	nboard to inte <i>annel:</i> cable a I above), one	rnal disks ba available as d 2-drop EIDI	ýs; Hot-sw option pn 3 E cable (to	al channel: Fixed d ap models: one 1- 2P8164 from syste o CD-ROM) d seek / S.M.A.R.1	drop 16- emboard	bit 68-pin LVD S0	CSI cable	to 6-bay
Rack support Bus slots (see below Chipset	Intel E7505 ch A for slots 2 ar	OMHz PCI nipset / E7 nd 3 and e	I-X 1.0 / one F 7505 MCH (M thernet contro	CI 2.2 / one I emory Contro bler; Bus B fo	Mini PCI /o oller Hub) f or slots 4 ar	ne AGP 8X (not av or AGP 8X slot, P6 nd 5 and SCSI con w Pin Count Interfa	64H2, ICH troller) / I	H4 / P64H2 for two /O Controller Hub	PCI-X b (ICH4) fo	uses (Bus or PCI 2.2
Ethernet  CD-ROM / diskette Ports  Diagnostics Systems mgmt cntrl	chip on planar CD-ROM: 48% Front: two US monitor (analo Diagnostic LE Winbond® W7	/ PCI-X 64 (-20X6 CD B (Ver 2.0 g DB-15), Ds / error 91D / chip	4-bit 100MHz D-ROM, IDE / I); Back: two l microphone- LEDs for fans p on planar / r	/ full duplex / Diskette: 3.5 JSB (Ver 2.0) in (mono), lins and memor monitors syst	Wake on L " 1.44MB o ), two seria e-in (stered y / server o tem and pro	l (9-pin), parallel, k o), line-out (stereo diagnostic progran	eyboard ) ns stored ire, fan s	at 1.0 / one rear Ќ , mouse, ethernet I on IBM Enhance peed and failure,	J-45 port (RJ-45), d Diagno	ostics CD
Graphics controller	SVGA / ATI® F	RageXL / d	on Mini PCI a	dapter / 8MB	SDRAM s	td and max / PCI 2	2.2 32-bit	33MHz / analog	I5-pin D-	Sub conn
Security	Mechanical side hot-swap mod power-on pass without keybo	els) / optionsword / bo	onal U-Bolt su oot sequence	upport via kno control / oper	ockout / ration	Xeon DP 2.0GHz/ Xeon DP 2.4B GH 256MB PC2100 C 512MB PC2100 C	z/533/51 L2.5 EC L2.5 EC	2KB L2 Cache Pr C DDR-SDRAM C DDR-SDRAM	oc Üpg	59P5112 59P5108 33L5037 33L5038
Software	ServerGuide installation and (system hardy	d configur	ation tool), IB	M Director	ios	1GB PC2100 CL2 2GB PC2100 CL2 IBM 73.4GB 10K IBM 146GB 10K L	.5 ECC [ Ultra320	DDR-SDRAM DIM SCSI 68-pin <u>(not</u>	M hot-swp)	
Keyboard / mouse Cooling fans  Power supply(s)	Restart (ASR)	r processo cage fan (e dant / not 5 watt std 0 watt std sal / voltag / cooling f	or(s), memory even in dual p hot-swap / all and max / not and max / hot e-sensing / Au	, and disk bay ower supply i variable spec hot-swap -swap / redur utomatic Serv upply(s) (vari	pin PS/2) ys / one model) ed ndant ver iable spd)	IBM 36.4GB 15K L IBM 73GB 10K UIt IBM 146GB 10K L 40X/12X/40X Max IBM Remote Supe IBM 4U Extended IBM ServeRAID-5 IBM T541 15" Flat Other options at it	Jltra320 S ra320 SC Jltra320 of CD-RV ervisor A Depth T i Controll t Panel C	SCSI Hot-Swap SI SI Hot-Swap SL I SCSI Hot-Swap SV Internal (black) dapter (PCI adapt ower-to-Rack Kit er (adapter for Slot color Monitor (blace)	HDD HDD SL HDD er) (4)	06P5776 32P0727 32P0728 22P6976 09N7585 59P4817 25P3492 9512AB1
diskette  diskette  diskette  o  o  o  o  o  o  o  o  o  o  o  o  o	t 100MHz, PCI- t 100M	X 1.0 (3.3 X 1.0 (3.3 X 1.0 (3.3 X 1.0 (3.3 Hz (5v) - u y) - unavai AID-5i ", access, access, access, access, o access, o access, o access, o access,	(av) (3v) extended* (av) (3v) extended* (av) (av) (av) (av) (av) (av) (av) (av)	Configue pressing BIOS Set LSI Cone pressing DMI 2.2- Adv Core Diagnos Four state Handle IP H 467m 444 to 57 Fixed die bays 4,5 easy action memory with IBM	able left sid ration/Sett g F1 at stan etup Utility Infiguration g CTRL+C -compliant nfig Power Driver and stics CD-RG sbilizing fee grip on top x W 6.5" x m x W 165" pounds (2 isk models. 5,6,7 rotate cess for ca ve Failure v r, processo M Director of	up Utility invoked brup via F1 at startup Utility near startup Utility near startup Interface (ACPI) 1 IBM Enhanced DM included tt D 26.0" mm x D 660mm 0 to 25.8kg) r metal cage for dis	⇔ 1	LIMITED WA year parts and lal aternational Warra n site, 8 am-5 pm lon-Fri excluding ext business day n site service upg ptions (in eligible 3 year IOR 9x5, 1 (ServicePac® part 3 year IOR 9x5, 4 (ServicePac part 3 year IOR 24x7, (ServicePac part 4 year IOR 24x7,	oor Inty Servi holidays, response grade locations IBD resp num 69P9 4 hr avg num 69P9 2 hr avg num 69P9 port for v	ice <sup>3</sup> itime  s): <sup>7</sup> onse 99509) esponse 510) response 511) response 512) warranty

IBM® Type-model Processor	L2 FSB GHz <sup>1</sup> cache MHz Memory	Disk Disk controll		slots Power supply Available bays number and type Ethernet date
8647-42X 1 x Xeon 8647-4AX 1 x Xeon 8647-4BX 1 x Xeon 8647-52X 1 x Xeon 8647-5AX 1 x Xeon 8647-5BX 1 x Xeon	2.67 512KB 533 512MB None 2.67 512KB 533 512MB None	(open-bay) Ultra32 B Ultra320 10K Ultra32 (open-bay) Ultra32	20 6 hot-swap 6 20 6 hot-swap 6 20 None (4 fixed) 6 20 6 hot-swap 6	x 9 One fixed Gigabit Feb 2003 x 9 Two redundant Gigabit Feb 2003
Processor(s) SMP - L2 Cache Implementation	1 x Intel® Xeon at 2.67 or 2.8B Gh 2-way SMP / up to two Xeon Proc Systemboard contains two Intel 604- one Mini PCI [used by graphics], or	essors (same speed/ca -pin micro-PGA ZIF soc	ache size) / <b>512KB</b> s kets, four DIMM slots	, seven slots (one PCI 2.2, four PCI-X,
Memory	DDR-SDRAM DIMMs / four DIMM gold	ld-connector slots on syst annel / <b>Error Checkin</b> g	emboard / DIMMs mus g and Correcting (EC	00 266MHz CL2.5 registered 184-pin ECC st be installed in matched pairs [a bank] / CC) via 16-bit Checksum Chipkill™ s contained in two chips)
IDE disk controller SCSI disk controller SCSI channels and cables Cables Disk - features	supports <b>RAID-1 mirroring</b> (Embe RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (i channel: Fixed disk models: one 4-	nel Ultra320 SCSI con edded Mirroring) / sharv installed only in Slot 4) -drop 16-bit 68-pin LVI R-pin LVD SCSI cable to ard to rear external 68 e 2-drop EIDE cable (to	troller (LVD 320MB/sed with optional IBM Two 16-bit channels 0 SCSI cable from sy 0 6-bay backplane; E-pin connector CD-ROM)	sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID™-5i Controller for low-cost (one internal and one external) / <i>Internal</i> stemboard to internal disks bays; Hot- External channel: cable available as
Rack support Bus slots (see below Chipset	A for slots 2 and 3 and ethernet contr	PCI 2.2 / one Mini PCI /o Memory Controller Hub) roller; Bus B for slots 4 a	for AGP 8X sÌot, P64H nd 5 and SCSI control	able) / no hot-swap Active™ PCI slots I2, ICH4 / P64H2 for two PCI-X buses (Bus Ier) / I/O Controller Hub (ICH4) for PCI 2.2 I/NS PC87366 Super I/O off LPC interface
Ethernet  CD-ROM / diskette Ports  Diagnostics Systems mgmt cntrl	One gigabit 10/100/1000 ethernet conchip on planar / PCI-X 64-bit 100MHz CD-ROM: 48X-20X° CD-ROM, IDE / Front: two USB (Ver 2.0); Back: two monitor (analog DB-15), microphone Diagnostic LEDs / error LEDs for far Winbond® W791D / chip on planar / support for optional Remote Supe	z / full duplex / Wake on / <i>Diskette</i> : 3.5" 1.44MB USB (Ver 2.0), two serie -in (mono), line-in (stere ns and memory / server monitors system and pi	LAN® / Alert Standard diskette drive al (9-pin), parallel, keyl o), line-out (stereo) diagnostic programs s ocessor temperature.	Format 1.0 / one rear ÁJ-45 port board, mouse, ethernet (RJ-45), stored on IBM Enhanced Diagnostics CD , fan speed and failure, and voltages /
Graphics controller	SVGA / ATI® RageXL / on Mini PCI a	adapter / 8MB SDRAM	std and max / PCI 2.2	32-bit 33MHz / analog 15-pin D-Sub conn
Security	Mechanical side panel key lock (lock hot-swap models) / optional U-Bolt s power-on password / boot sequence without keyboard/mouse / security sl	ks hot-swap disks on support via knockout / e control / operation	Xeon 2.67GHz/533/5 Xeon 2.8B GHz/533/ 256MB PC2100 CL2 512MB PC2100 CL2	512KB L2 Cache Proc Upg /512KB L2 Cache Proc Upg .5 ECC DDR-SDRAM 33L5037 .5 ECC DDR-SDRAM 33L5038
Software	ServerGuide™ (CD-based automate installation and configuration tool), IE (system hardware mgmt software) a	BM Director	2GB PC2100 CL2.5 I IBM 73.4GB 10K Ulti	ECC DDR-SDRAM DIMM 33L5039 ECC DDR-SDRAM DIMM 33L5040 ra320 SCSI 68-pin ( <u>not hot-swp</u> ) 32P0724 a320 SCSI 68-pin ( <u>not hot-swp</u> ) 32P0725
Keyboard / mouse Cooling fans  Power supply(s)	IBM 101 key keyboard / IBM mouse (Four / three for processor(s), memory power supply cage fan (even in dual All: not redundant / not hot-swap / al Some: one 425 watt std and max / no 3BX: two 350 watt std and max / no All: universal / voltage-sensing / A Restart (ASR) / cooling fan in power stage.	y, and disk bays / one power supply model) Il variable speed of hot-swap ot-swap / redundant Automatic Server supply(s) (variable spd)	IBM 36.4GB 15K Ultra IBM 73GB 10K Ultra3 IBM 146GB 10K Ultra 40X/12X/40X Max <sup>6</sup> C IBM Remote Supervi IBM 4U Extended De IBM ServeRAID-5i Co IBM T541 15" Flat Pa Other options at ibm.	a320 SCSI Hot-Swap SL HDD 32P0727 a320 SCSI Hot-Swap SL HDD 32P0727 a320 SCSI Hot-Swap SL HDD 32P0728 cD-RW internal (black) 22P6976 isor Adapter (PCI adapter) 99N7585 epth Tower-to-Rack Kit 59P4817 ontroller (adapter for Slot 4) anel Color Monitor (black) 9512AB1
Slot 2: fullsize, 64-bi Slot 3: fullsize, 64-bi Slot 4: fullsize, 64-bi Slot 5: fullsize, 64-bi Slot 6: Mini PCI type Slot: fullsize, AGF * Extended slot for co  CD-ROM  Bay Bay Hot-swap Bay Bay Bay Hot-swap Max Fixe	it 33MHz, PCI 2.2 (5v) it 100MHz, PCI-X 1.0 (3.3v) extended it 100MHz, PCIX	<ul> <li>♦ BIOS Setup Utility</li> <li>s LSI Configuration pressing CTRL+C</li> <li>♦ DMI 2.2-compliant</li> <li>♦ Adv Config Power</li> <li>♦ Device Driver and Diagnostics CD-R</li> <li>♦ Four stabilizing fee</li> <li>♦ Handle grip on top</li> <li>♦ H 467mm x W 165</li> <li>♦ 44 to 57 pounds (2</li> <li>₱ Fixed disk models</li> <li>₱ bays 4,5,6,7 rotate</li> <li>p easy access for cape</li> <li>₱ Predictive Failure memory, process</li> <li>with IBM Director</li> </ul>	de panel up Utility invoked by rtup v via F1 at startup Utility near startup by Utility near startup by Interface (ACPI) 1.0a IBM Enhanced OM included et D 26.0" IBM X D 660mm IBM X D	Mon-Fri excluding holidays, next business day response time

IBM <sup>⊚</sup> Type-model Qty x I	L2 I Processor cache Memory	Memory SCSI type Disk controller Mecha	Slots x bays anical (hot-swap bays)	Power Available supply Ethernet date
8671-11X 1 x Xeon 8671-1AX 1 x Xeon 8671-21X 1 x Xeon 8671-21X 1 x Xeon 8671-2AX 1 x Xeon 8671-31X 1 x Xeon 8671-3AX 1 x Xeon 8671-3AX 1 x Xeon 8671-41X 1 x Xeon 8671-4AX 1 x Xeon Residential	1.8GHz     512KB 512MB 0       2.0GHz     512KB 256MB E       2.0GHz     512KB 256MB E       2.2GHz     512KB 256MB E       2.2GHz     512KB 512MB 0       2.4GHz     512KB 256MB E       2.4GHz     512KB 512MB 0	Chipkill™ None 2 x Ultra320Tow ECC None 2 x Ultra320Tow Chipkill None 2 x Ultra320Tow ECC None 2 x Ultra320Tow Chipkill None 2 x Ultra320Tow ECC None 2 x Ultra320Tow Chipkill None 2 x Ultra320Tow	rer 6x10 (6 hot-swap std; 9 rer 6x10 (6 hot-swap std; 9	9 max)2 hot-swapGigabit Jun 2002 9 max)1 fixed Gigabit Jun 2002 9 max)2 hot-swapGigabit Jun 2002 9 max)1 fixed Gigabit Jun 2002 9 max)2 hot-swapGigabit Jun 2002 9 max)1 fixed Gigabit Jun 2002 9 max)2 hot-swapGigabit Jun 2002
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel® Xeon™ Process 512KB / on die of processor 2-way SMP / up to two Xeon Systemboard contains two In	erver using the Xeon DP processor sor 1.8, 2.0, 2.2 or 2.4GHz with 4 / at processor speed (no L3 cache n Processors DP (same speed/cache ntel 603-pin micro-PGA ZIF socket Active™ PCI slots), and integrated	400MHz frontside bus / Hyp e) the size) ts, six memory gold-connecto	per-Threading technology
Memory	PC2100 266MHz registered DIMMs must be installed in n 256MB models: Error Check 512MB models: Error Check	max / two slots used / four slots d 184-pin ECC DDR-SDRAM DIN matched pairs [a bank] / 2-way mer king and Correcting (ECC) / corr king and Correcting (ECC) via 1 ough 8-bit errors contained in two	/IMs / mory interleave / dual chann ects single-bit errors and det 6-bit Checksum Chipkill™ (	(corrects 1, 2, 3, or 4-bit errors on
SCSI channels	supports RAID-1 mirroring shared with optional IBM Se Two 16-bit channels / SCSI interface for Bay 8 and 9 (may a external SCSI knockout in Enhanced IDE ATA-100 con None standard / supports 72	channel Ultra320 SCSI controll with up to one hot-spare disk / erveRAID™-5i Controller for low-controller for low-controller for low-controller for low-controller for low-controller a cable) or with optional in rear (cable req 32P8164) or via htroller in CSB5 South Bridge / one 200-15000 rpm disks / one backpl connectors / three additional hot	ost RAID 0, 1, 1E, 5, 00, 10, ole from controller to backpla al 3-Pack Kit (cable included or opt ServeRAID adapter wit e connector on planar / one ane / all disk bays Ultra320-	, 1E0, 50 (installed only in Slot 4) ane; Channel B: 16-bit 68-pin d); supports external SCSI devices the external connector(s) 1-drop IDE cable (CD-ROM) enabled
Mechanical Chipset	ServerWorks® Grand Char two CIOB-X2 I/O Bridges (IM controllers; IMB2 bus to Hos	A 19" Rack (5U⁴) via optional kit fo mpion™ 4.0 LE / CMIC LE Host B MB2 bus to Host Bridge for PCI-X st Bridge for PCI-X 1.0 Bus C with and graphics controller, EIDE, U	Bridge (memory controller an 1.0 Bus B with slots 2, 3, 4 1 slots 5 and 6) / CSB5 Sout	nd I/O Bridge) / and Ultra320 and ethernet h Bridge (Thin IMB to Host Bridge
	48X-20X <sup>6</sup> CD-ROM / IDE / 1. Rear: two USB (Vers 1.1), k Front: one USB (Vers 1.1);	.6" HH; <i>Diskette:</i> 3.5" 1.44MB disk keyboard, mouse, parallel, serial (\$ <i>Graphics:</i> SVGA / ATI® Rage XL /	kette drive / dust cover 9-pin),graphics (DB-15), ethe ⁄ on planar / 8MB SDRAM sto	/Wake on LAN® / Alert Standard Format ernet (RJ-45), two RJ-45 (sys mgmt) d/max / 32-bit 33MHz PCI 2.2 Bus
Security	Power-on password / admin button / unattended boot / se	nistrator password / hinged and loo electable boot		
Systems mgmt  Diagnostics  Software	IBM Integrated system mand H8S2148 / on planar / provious monitoring such as temp, op supports optional Remote Structure on planar for containing the path Diagnostics™ path	magement processor (ISMP) / des system and environmental otional disks, fans, power supp / upervisor Adapter with 20-pin tinuous power (no ext pwr reqd) anel providing LED map to ) / Information LED Panel in front installation and configuration	- Xeon DP 1.8GHz/512KB L Xeon DP 2.0GHz/512KB L Xeon DP 2.2GHz/512KB L Xeon DP 2.4GHz/512KB L 256MB PC2100 CL2.5 EC 512MB PC2100 CL2.5 ECC 1GB PC2100 CL2.5 ECC 2GB PC2100 CL2.5 ECC IBM ServeRAID-5i Contro IBM Remote Supervisor A	L2 Cache Proc Upg 33P2931 L2 Cache Proc Upg 37L3533 CC DDR-SDRAM DIMM 33L5037 CC DDR-SDRAM DIMM 33L5038 CDDR-SDRAM RDIMM 33L5038 CDDR-SDRAM RDIMM 33L5040 CDDR-SDRAM RDIMM 33L5040 CDDR-SDRAM RDIMM 25P3492
Keyboard / mouse Power supply	IBM 101-key keyboard / IBM x1X: std: one 560 watt / no max: two 560 watt with xAX: std: two 560W / hot-sv	M mouse (both black) ot hot-swap or redundant optional Upgrade Kit 33P2753 wap / redundant o-restart / fan in each power supp variable speed / hot-swap /	IBM T541 15" Flat Panel Co	olor Monitor (black) 9512AB1 O SCSI Hot-Swap SL HDD 06P5776 p Expansion Kit 33P2751 E Kit (two supplies) 33P2753 conversion Kit III 59P4211 /pc/us/accessories
Slot 2: full, 64-bit 10 Slot 3: full, 64-bit 10 Slot 4: full, 64-bit 13 Slot 5: full, 64-bit 13 * Extended slot for o    5.25" HH	MHz 5v PCI 2.2, Bus A 10MHz 3.3v PCI-X, not hot, Bu 10MHz 3.3v PCI-X, not hot, Bu 10MHz 3.3v PCI-X, not hot, Bu 10MHz 3.3v PCI-X, hot-swap, 13MHz 3.5v PCI-X, hot-swap, 13MHz 3.5v PCI-X, hot-swap, 13 3.5", SL 1", access, hotal 13 3.5", SL 1", access, hotal 15 3.5", SL 1", access, hotal 15 3.5", SL 1", access, hotal 16 3.5", SL 1", access, hotal 17 3.5", SL 1", access, hotal 18 3.5", SL 1", access, hotal 19 3.5", SL 1", access, hotal 19 3.5", SL 1", access, hotal 10 3.5", SL 1", access,	Quick release adapters us B us B* us B* us B* Bus C Bus C Bus C ller skette ot-swap ot	ility invoked by  n Utility near startup  r™) by pressing  anel (in front) sis on disk options, /RMs, power onjunction with IBM ystem administrator hent failure 8.5" x D 27.6"  sk capacity: 4GB SL disks with	cer parts and labor ternational Warranty Service <sup>3</sup> n site, 8 am - 5 pm, Mon - Fri verage excluding holidays, next siness day response time <sup>7</sup> year on site warranty service grade options (in eligible cations): <sup>7</sup> 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac® part num 21P2083) 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 21P2084) 24 hr x 7 day coverage, 2 hour average response (ServicePac part number 21P2085) x7 <sup>14</sup> toll-free support for warranty sues during the warranty period <sup>3</sup>

See footnotes for important warranty information US models announced June 11, 2002

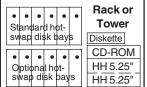
• = Hot-swap

(X235) © IBM Corp. July 2002

IBM® Type-model Qty x I	L2 Processor cache	FSB MHz M	lemory Disk	SCSI controller Mecha	Slots x ba inical (hot-swap b			ilable date
8671-61X 1 x Xeon <sup>®</sup> 8671-6AX 1 x Xeon 8671-71X 1 x Xeon 8671-7AX 1 x Xeon	2.67GHz 512KB 2.8BGHz 512KB	533Mhz 5 533Mhz 5	512MB None 512MB None	e 2 x Ultra320 Tow e 2 x Ultra320 Tow	er 6x10 (6 hot-swap er 6x10 (6 hot-swap er 6x10 (6 hot-swap er 6x10 (6 hot-swap	std; 9 max) 2 hot-si std; 9 max) 1 fixed	Gigabit Mar	2003 2003
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel® Xeon™ 512KB / on die of p 2-way SMP / up t Systemboard cont	Processor / o two Xeor two Ironia	or 2.67 or 2.6 at processor n Processors ntel 603-pin	BBGHz with 533Ml speed (no L3 cache (same speed/cacl micro-PGA ZIF soc		per-Threading technology	ology	:e
Memory	PC2100 266MHz DIMMs must be ins Error Checking a	registered stalled in ma ind Correc	184-pin ECC atched pairs   cting (ECC)	via 16-bit Checks		cts 1, 2, 3, or 4-bit e	errors on same of	MHz / chip
SCSI disk controller SCSI channels  IDE controller / cable Disk - capacity Disk - bays	supports RAID-1 low-cost RAID 0, Two 16-bit channe interface for Bay 8 devices via externa Enhanced IDE AT None standard / su	mirroring 1, 1E, 5, 00 els / SCSI 8 and 9 (m al SCSI kno A-100 con upports 720	with up to on 0, 10, 1E0, 5 Channel A: 1 ay require a ockout in real troller in CS 00-15000 rpm	ne hot-spare disk / 0 (installed only in 6-bit 68-pin LVD c cable) or with opt r (cable req 32P81 35 South Bridge / o disks / one backpl	shared with optiona Slot 4) able from controller onal 3-Pack Kit (cab 64) or via opt ServeF	al ÍBM ServeRAID <sup>TM</sup> .  to backplane; <i>Char</i> ble included); suppou  RAID adapter with ex  anar / one 1-drop ID  tra320-enabled	5i Controller for onel B: 16-bit 68 ts external SCS ternal connector E cable (CD-RO	er B-pin SI r(s) OM)
Mechanical Chipset	ServerWorks® Gr two CIOB-X2 I/O E controllers; IMB2 b	and Cham Bridges (IM ous to Host	<b>pion™ 4.0 L</b> B2 bus to Ho Bridge for P	E / CMIC LE Host E st Bridge for PCI-X CI-X 1.0 Bus C with	or support in IBM Net ridge (memory contro 1.0 Bus B with slots slots 5 and 6) / CSB SB, SMBus, LPC bus	oller and I/O Bridge) 2, 3, 4 and Ultra320 5 South Bridge (Thin	and ethernet IMB to Host Brid	idge I/O
Ethernet controller CD-ROM / diskette Rear ports Front port / graphics	48X-20X6 CD-ROM Rear: two USB (Ve	/I / IDE / 1. ers 1.1), key	.6" HH; <i>Disk</i>	<i>tette:</i> 3.5" 1.44MB ( e, parallel, <b>two</b> serial	( 64-bit 100MHz / full ( diskette drive / dust ( (9-pin),graphics (DB- planar / 8MB SDRAN	cover 15), ethernet (RJ-45),	two RJ-45 (sys n	
Security	Power-on password button / unattender			ord / hinged and lo	ckable front door to c			
Systems mgmt  Diagnostics  Software	IBM Integrated sy H8S2148 / on plan monitoring such as supports optional if connector on plans Light Path Diagno failing part (under s ServerGuide™ (C utilities), IBM Direct	ear / provide s temp, opti Remote Sup ar for contir pstics™ par side cover) / D-ROM ins	es system and ional disks, far pervisor Ada nuous power nel providing / Information stallation and	d environmental ans, power supp / oter with 20-pin (no ext pwr reqd) LED map to LED Panel in front	Xeon 2.8BGHz/512 128MB PC2100 CL 256MB PC2100 CL 512MB PC2100 CL 1GB PC2100 CL2. 2GB PC2100 CL2. IBM ServeRAID-5i IBM Remote Super	2KB L2 Cache Proc 2KB L2 Cache Proc L2.5 ECC DDR-SDR L2.5 ECC DDR-SDR 5 ECC DDR-SDRAN 5 ECC DDR-SDRAN 6 ECC DDR-SDRAN 7 ECC DDR-SDRAN 8 ECC DDR-SDRAN 9 ECC DDR-SDRAN 9 ECC DDR-SDRAN 9 ECC DDR-SDRAN 10 ECC DDR-S	Upg 71P AM DIMM 33L AM DIMM 33L AM DIMM 33L I RDIMM 33L I RDIMM 33L for slot 4) 25P lapter) 09N	P8966 P8967 _5036 L5037 _5038 _5039 _5040 P3492 N7585
Keyboard/mouse Power supply	xAX: std: two 560 All: voltage-sens Four fans and two	O watt / not O watt with OW / hot-sw sing / auto-r blowers / v	hot-swap or i optional Upo vap / redunda restart / fan ir variable spee	edundant grade Kit 02R1874 nt each power supp d / hot-swap /	36.4GB 15K-2 80 U 3-Pack Ultra320 Ho IBM 560W Hot-Swa 5Ux24D Tower-to-F Other options at i	Itra320 SCSI Hot-Sw bt-Swap Expansion K ap Power Upgrade I Rack Conversion Kit ibm.com/pc/us/acce kward compatible with	rap SL HDD 06P it 33P Kit* 02F II 59P ssories	P5776 P2751 R1874 P4211
5.25" HH 5.25" HH CD-ROM	OMHz 3.3v PCI-X, I OMHz 3.3v PCI-X, I OMHz 3.3v PCI-X, I 3MHz 3.3v PCI-X, I 3MHz 3.3v PCI-X, I 1 1 3.5", SL 1", a 2 3.5", SL 1", a 3 3.5", SL 1", a 6 3.5", SL 1", a 6 3.5", SL 1", a 6 3.5", SL 1", a	us A not hot, Bus not hot, Bus not hot, Bus not-swap, B not-swap, B 5i Controlle access, hot access, hot access, hot access, hot access, hot access, hot access, coe access, coe access, coe access, coe access, coe access, coe	S B Cope S Bus C Cope S Bus C Cope S Bus C Cope S Cope	ck release adapter so figuration/Setup Ut ssing F1 at startup Logic Configuration oressing CTRL+C gnostics (PC-Doctor at startup P12.0-compliant erator Information P dictive failure analy mory, processors, volles, and fans in compliant in control of the control	Iity invoked by  In Utility near startup  In I	<ul> <li>⇒ 3 year parts and</li> <li>⇒ International Wa</li> <li>⇒ On site, 8 am - 5</li> <li>coverage exclud</li> <li>business day re</li> <li>⇒ 3 year on site way</li> <li>upgrade options locations):7</li> <li>• 9 hour covera</li> <li>Mon-Fri exclud</li> <li>4 hour averag</li> <li>(ServicePace)</li> <li>• 24 hr x 7 day</li> <li>4 hour averag</li> <li>(ServicePacp</li> <li>• 24 hr x 7 day</li> <li>2 hour averag</li> <li>(ServicePacp</li> </ul>	pm, Mon - Fri ling holidays, no sponse time? arranty service (in eligible  ge, ding holidays, e response eart num 21P2083 coverage, e response art number 21P20 coverage, e response	33) 084)
Tower di	ays 8 and 9 supportsks via 3-Pack Kit 3	3P2751	660 3-P	.6GB <sup>2</sup> with nine 73.4 ack Ultra160 Hot-Sw	GB SL disks with	24x7 <sup>14</sup> toll-free s issues during th	upport for warr	ranty iod³

IBM® Type-model Qty x P	rocessor	L3 cache	Memory	ECC memory features	Disk	SCSI controll	er	Mech- anical		lots x bays	Hot-swa bays (st		Ethernet	Available date
8685-41X 1 x Xeon™ 8685-4RX 1 x Xeon № 8685-5RX 1 x Xeon № 8685-5RX 1 x Xeon № 8685-61X 1 x Xeon № 8685-6RX 1 x Xeon №	MP 1.5GHz MP 1.9GHz MP 1.9GHz MP 2.0GHz	1MB 1MB 1MB 2MB		Hot Spare/Chipkill <sup>1</sup> Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill Hot Spare/Chipkill	None None None None	2 x Ultra 2 x Ultra 2 x Ultra 2 x Ultra	160 160 160 160	7U⁴ rack Tower 7U rack Tower	7 x10 7 x10 7 x10 7 x10	(16 ba (16 ba (16 ba (16 ba	ays max) ays max) ays max) ays max)	6/12 6/12 6/12 6/12	Gigabit Gigabit Gigabit Gigabit	Nov 2002 Nov 2002 Nov 2002 Nov 2002 Nov 2002 Nov 2002
Positioning Processors L2 cache L3 cache Processor upgrade Implementation	1 x Intel® Xe 512KB / on o 1MB or 2MB 4-way SMP Systemboar	eon™ F die of p B / on di / up to d conta	Processor rocessor e of proc four Xeor lins four I	stem loaded with X- r MP 1.5, 1.9, or 2.0 / at processor spee essor / at processo n Processors MP (s ntel 603-pin micro- SCSI, ethernet, gra	OGHz¹ v d r speed ame spe PGA ZIF	vith 400Ml eed/cache	Hz fr	ontsidé b e)	ous / H	yper-T	hreading	ı techn	ológy	nology
Memory	SDRAM DIN or quads [a [a bank]; red supported v	//Ms / o bank] qs add vith an	one mem / 2- or 4- itional mo y OS) / I	<sup>3</sup> max / two slots u ory-board std with way memory interled emory matching fail Error Checking and detects 2- through	12 DIM eave / <b>F</b> led ban n <b>d Corr</b>	M gold-collection (Magnetic Spare Rective Control)  Magnetic (Application of the Control of the	onne Me ve M (CC)	ctor slots mory (ad emory™ via 16-k	s / DIN ctivate via n oit Ch	IMs m d by fa nemo ecksu	nust be in ailure of r <b>y mirro</b>	nstalled a pair <b>ring</b> (r	d in mate or quad memory	ched pairs of DIMMs mirroring
SCSI disk controller SCSI connectors IDE controller / cabling Disk - capacity Disk - bays	Channel B: ( Channel A: ( Enhanced IE None standa	68-pin 68-pin DE AT <i>A</i> ard / su	connecto connecto k-100 con pports up	Iltra160 SCSI (LVD r on planar to SCSI r on planar for optio troller in CSB5 Sou to 15,000 rpm disk max: six additional	backpla nal one- th Bridg s / 80-pi	ne (one-d drop 16-b e / one on n SCA-2 (	lrop f it LV e-dre conn	16-bit LV 'D cable ( op IDE ca ectors	D cable 32P81 able fro	e) / I 64) to om IDE	rear 0.8	mm VH er to C	IDCI con D-ROM	nector
Mechanical Rack / conversion Architecture / chipset	Rack system ServerWorl two CIOB-X ethernet and SMBus, IOA Six hot-swap	ns`suṕ  ks® Gra I/O Bri d one F APIC, L p PCI-)	oorted in and Chardges (IM CI 2.2 bu PC bus to ( 1.0 slot	B bus to Host Bridg us for SCSI / CSB5 o Super I/O) / five p	ks / kit a MIC Ho ge, one South E eer PC ower an	vailable to st Bridge with two F Bridge (Th buses / N d attention	o coi (Mei CI-) iin IN NS P n ind	nvert tow mory Cor X buses ( MB to Hos C87417 licator lig	rer to r ntroller C and st Brid Super thts (or	ack (ur and I D, oth ge, on I/O (dotical)	se NetBa /O Bridg er with o e PCI 2.3 iskette, l sensors o	AY11 f e) and ne PC 2 bus A keyboa control	five REM I-X bus E A, EIDE, ard, mou power to	MCs / B and USB, se)
Ethernet controller CD-ROM / diskette Rear ports Graphics controller	CD-ROM: 48 Four USB (V two RJ-45 (fe	8X-20X /ers 1.1 or integ	CD-RO ), one se rated sys	t / Broadcom® BCM M, IDE (ATAPI), 1.4 rial (9-pin), keyboa stem management p lanar / 8MB SDRAN	6" HH, b d (PS/2 process	ootable / / ), mouse ( or) / no pa	<i>Disk</i> (PS/2 ralle	<i>ette drive</i> 2), etherr I port	e: 3.5" net (RJ	1.44 N -45), g	IB disket graphics	te drive (DB-15	e, dust co 5),	
Security				istrator password / ded boot / selectabl		and locka	able	front doo	r to co	ver dis	sk bays,	power	button, a	and reset
Systems managemen  Diagnostics  Software	H8S2148/o monitoring s supports opt connector or <b>Light Path I</b> failing part (u	n plana such as tional R n plana Diagno under to le™ (CI	ar / provide temp, op emote Su r for conti <b>stics™</b> p op cover) D-ROM in	es system and envi optional disks, fans, p upervisor Adapter w nuous power (no ex anel providing LED / Information LED F stallation and config	ronmen ower suith 20-p aternal p map to Panel in	tal ipplies / in ower req)	51 10 Xe Xe Xe 6-µ 37	6MB PC 2MB PC 6B PC16 6 On MP 1 6 On MP 2 6 Oack Ultr 0 watt Ho M 7U x 2	1600 E 00 EC 5GHz .9GHz .0GHz a320 H ot-Swa	ECC D C DDF /1MB   /1MB   /2MB   Hot-Sv up Red	DR SDR R SDRAM L3 Cache L3 Cache L3 Cache vap Expa lundant F	AM RI M RDIN Proc Proc Proc Insion	OIMM MM Upg Upg Upg Kit Supply	33L3281 33L3283 33L3285 59P6815 59P6816 59P6817 32P8163 31P6133 I 32P1474
Keyboard / mouse Power supply Fans	Tower only: Std: two 370 redundant w universal (vo Nine hot-sw	IBM 10 0 watt h rith four oltage s vap red	03-key ke not-swap; power si ensing) / lundant f	ryboard / IBM mous Max: four 370 wa upplies / tool-free in- fans in each power ans / plus fan in ea- ilure signals diagno	t hot-sw stall / supply ch powe	/ap / ^ / PFA er supply/	IBI Me IBI IBI IBI IBI	M Extern	al SCS Cable RAID <sup>TA</sup> B 15K B 10K e Supe 5" Flat	SI Inte Kit (2: -4H U Ultra1 Ultra1 erviso Panel	rface Kit -drop SC Iltra160 S 60 SCSI 60 SCSI r Adapte Color Mo	(for re SI to H SCSI A Hot-S Hot-S r (PCI a pnitor (	ar SCSI) IH bays) dapter wap SL wap SL adapter) black)	32P8164 10K2340 37L6889 06P5768 06P5756

□ Tower dim: H15.5" x W17.6" x D29.8"; 104 to 150 lb Slot 1: 32-bit 33MHz 5v PCI, not hot-swap, Bus A;
□ Rack dim: H12.0" x W17.6" x D27.7"; 104 to 150 lb
primarily for for optional Remote Supervisor



⇒ Black color ⇒ ACPI 1.0 ⇒ Orange con

 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 primarily for for optional Remote Supervisor Adp Slot 2: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B Slot 3: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B 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

Setup Program is available by pressing F1 at startup; <u>Diagnostics</u> (PC-Doctor) by pressing F2 at startup; CTRL+A for SCSISelect Utility

Removeable top cover

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

Maximum internal disk capacity:  $880GB^2$  with twelve 73.4GB SL hot-swap SCSI disks

### LIMITED WARRANTY3

3 year parts and labor

✓ International Warranty Service³
✓ On site, 8 am-5 pm, Mon-Fri coverage excluding holidays, next business day response time⁵
✓ On site service upgrade options (in eligible locations):⁵

 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)

 Other ServicePac options at ibm.com/services/its/us/ source/wamomxeu.pdf

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

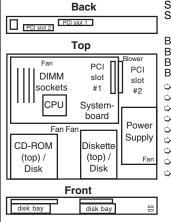
See footnotes for important warranty information

= Hot-swap

US models announced November 5, 2002

9

IBM® Type-model Qty x P	L2 rocessor cache	FSB MHz Mer	Memory nory type	Disk	Disk controller	Disk bays	Mech- anical	Slots x bays	Ethernet	Limited warranty	Available date
8673-92X Pentium® 8673-12X Pentium 4 8673-13X Pentium 4 8673-42X Pentium 4 8673-43X Pentium 4 8673-62X Pentium 4 8673-63X Pentium 4	2.0GHz 512KE 2.0GHz 512KE 2.4GHz 512KE 2.4GHz 512KE 2.67GHz 512KE	3 400 256 400 256 533 256 533 256 533 256	SMB         ECC           SMB         ECC	40GB <sup>2</sup> EIDE 40GB EIDE 18.2GB SCSI 40GB EIDE 18.2GB SCSI 40GB EIDE 18.2GB SCSI	Ultra160 ATA-100 Ultra160 ATA-100	2 fixed 2 fixed 2 fixed 2 fixed 2 fixed	1U rack 1U rack 1U rack	2x4 2x4 2x4 2x4 2x4 2x4 2x4 2x4	2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi	t 1 year t 1 year t 1 year t 1 year t 1 year	Aug 2002 Aug 2002 Oct 2002 Oct 2002 Oct 2002
Positioning Processor(s) L2 cache SMP support Implementation	Intel® Pentium 512KB / on die No SMP suppor Systemboard co	4 at 1.8 or of process t ontains one	2.0GHz <sup>1</sup> with sor / at proces Intel mPGA47	k-optimized serv 400MHz frontsic sor speed (no L 8B socket (with F PCI-X slot, and	de bus (FS .3 cache) Pentium 4 l	FC-PGA	2 and heats	sink), fo	our memory	DIMM sl	ots,
Memory	DIMMs / four D	IMM gold-o	connector slots	/ three slots ava s on systemboai nemory controlle	rd / memo					CC DDR-	SDRAM
SCSI disk controller SCSI connectors IDE disk controller Cables Disk - features	SCSI models: Enhanced IDE SCSI models: EIDE models:	64-bit 66M On adapte busmaster one 2-drop one 2-drop	Hz PCI adaptor: one 68-pin 5 / ATA-100 suportority 16-bit LVD Sortority 16-bit LVD Sortority 16-bit LVD Sortority 16-bit LVD Sortority 16-bit PC (16-bit PC)	gle channel Wi er / one channel SCSI connector / port / two conne CSI cable, one 1 to CD-ROM and 5.2ms read seek	with up to one 0.8m ctors on sy -drop 40-c disk), one	15 devicem VHDC ystemboo conducto 1-drop E	e support I 68-pin ex ard r EIDE cab EIDE cable	ternal o	connector inected to C cond disk b	ay) ´	
Mechanical Architecture / chipsets Bus slots	s ServerWorks® one CIOB-X2 I/ CSB5 South Br National Semic	<b>Grand Cha</b> O Bridge (II idge (Thin I onductor® F	ampion™ SĹ/ MB bus to Hos MB to Host Br PC87414 Supe	/ supports 16.75 CMIC-SL (Supe st Bridge for PCI idge for PCI 2.2- er I/O chip (serial hot-swap Active	er Lite) Hos -X Bus A w based gra , keyboard	st Bridge vith slots phics co I, mouse	(memory o and PCI-X ntroller, EI	controll ( Bus E	ler and I/O E B with dual e	Bridge) / ethernet)	
Ethernet controllers  CD-ROM / diskette Rear ports Front ports / graphics Console interconnects	on planar / PCI- 24X-10X <sup>6</sup> CD-R Rear: serial (9- Front: two USE	X 64-bit 100 OM / IDE; pin), two etl (Vers 1.1);	OMHz Bus B / 1 Diskette: 3.5" nernet (RJ-45) <i>Graphics:</i> SV		/ Wake on drive / dus se, analog I XL / on pla	LAÑ® / A t cover DB-15 m nar / 8M	lert Standa onitor / no p B SDRAM	ard For parallel std/ma	mat 1.0 / tw port	o rear Ru	J-45 ports
Systems mgmt Diagnostics	Diagnostics via	PC-Doctor	on a standard	rs system and pr I IBM Enhanced conn on planar fo	Diagnostic	cs CD (di	skette can	be crea	ated) / supp		
Security Software	Power-on pass unattended boo <b>ServerGuide™</b> utilities), IBM D	t / selectab (CD-ROM)	le boot / unatte nstallation and	ended start mode	51 1G 12	2MB PC BB PC21 0GB AT	2100 CL2. 00 CL2.5 E A-100 EID	5 ECC ECC DI E HDI	DDR-SDR/ DDR-SDR/ DR-SDRAW D (7200 rpr	AM DIMN I RDIMM n)*	//33L5038 33L5039 09N4231
Cooling fans Power supply Prerequisites	power supply) /	variable sp rsal / auto- ard, mouse	eed / not redu sensing / auto rack, operatir		SII 36 Ap 73 Re Se IBI IBI IBI IBI Ot	.4GB 15h .4GB 10h ernote Su erveRAID M T541 1 M NetBA M NetBA M ACT L her optio	《Ultra160 《Ultra160 pervisor A pervisor A TM-4Lx Ulti 5" Flat Pa Y25 Stand Y42 Ente local Cons ns at <b>ibm.</b>	SCSIS SCSIS dapter ra160S nel Col lard Ra rprise sole Ma com/po	Rack	O* O* er (black) ories	06P5765 06P5766 06P5752 09N7585 06P5740 9512AB1 9306250 930842S 1735L04



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

Bay ① 3.5", UltraSlim 0.5", access, Bay ② 5.25", UltraSlim 0.5", access, Bay ③ 3.5", SL 1", no acces Bay ④ 3.5", SL 1", no acces 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

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

See footnotes for important warranty information US models announced October 15, 2002; previous models on August 20, 2002

✓ US models withdrawn effective February 28, 2003

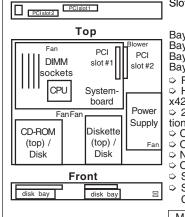
### **LIMITED WARRANTY**<sup>3</sup>

- 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 avg response

  - (ServicePac® part num 69P9505) 3 year IOR 9x5, 4 hr avg response
  - (ServicePac part num 69P9507)
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9508)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

(ServicePac part num 69P9506) 3 year IOR 24x7, 4 hr avg response

IBM® Type-model	Proces	sor	Memory	Disk	Disk controller	Mechanical	Slots	s x bays	Hot-swap disk bay		Power supply	Available date
8673-4AX P	entium 4®	2.4Ghz <sup>1</sup>	256MB	36.4GB <sup>2</sup>	Ultra 160	1U⁴ rack	2 slots	s x 4 ba	ys None	2 x Gigabit	DC power	Mar 2003
				ned for netv wer enviro	vork infrastrud nments	ctures requir	ing ne	twork				
Positioning Processor L2 cache SMP support Processor up Implementation	grade	Intel <sup>®</sup> Pe 512KB / No SMP None su Systemb	entium 4 on die of support pported oard conta	2.4Ghz with processor /		ntside bus speed (no L3 socket (with I	cach	e) m 4 FC-	PGA2 and		ur memory DIM tors, ethernet, a	
Memory - std Memory - soc Memory - feat Memory - sup	kets tures	4 socket PC2100	266MHz 1	able / ECC registered 1	(Error Checkir 84-pin gold-pla ECC DIMMs /	ated DIMM	O,		MMs and	ECC memory	controller	
SCSI disk co SCSI Connec Cables Disk - feature	ctors	On adap one 2-dr	iter: one 6 op 16-bit	8-pin SCSI LVD SCSI	channel Wide connector / o cable, one 1-c pm, 5.2ms rea	ne 0.8mm V Irop 40-cond	HDCI	68-pin e	external co	nnector	z PCI adapter ROM)	/ 15 device
Architecture /	·	one CIO CSB5 So / Nationa	B-X2 I/O I outh Bridg al Semico	Bridge (IMB e (Thin IME nductor® PC	bus to Host E to Host Bridg 87414 Super	Bridge for PÖ ge for PCI 2.2 I/O chip (se	I-X Bu 2-base rial, ke	ı́s A with ed graph eyboard	n slots and ics contro , mouse, c	l PCl-X Bus l ller, EIDE, Us liskette)	ller and I/O Br 3 with dual eth SB, LPC bus to quires vented	ernet) / o Super I/C
Ethernet con  CD-ROM / di Rear ports Front ports/g Console inte	iskette graphics	on planar 24X-10X <i>Rear:</i> se <i>Front:</i> tw	:/PCI-X 64 6 CD-RON erial (9-pin vo USB (Ve	I-bit 100MHz /I / IDE; <i>Dis</i> I), two ether ers 1.1); <i>Gra</i>	: Bus B / full dup skette: 3.5" 1.4 net (RJ-45),ke	blex / PXE / W 4MB diskette yboard, mou ATI® Rage XL	ake or drive se, an / on pl	LAN® / / dust o alog DB anar / 8N	Alert Stand cover -15 monito MB SDRAM	ard Format 1.0 or / no paralle 1 std/max / 32-	and PHY layer ) / two rear RJ-4 el port bit 33MHz PCI	5 ports
Systems mgr Diagnostics					nar / monitors a a standard IE						nd failure, and reated)	voltages
Graphics cor	ntroller	SVGA /	PCI bus /	ATI® Rage	XL(on planar) DC2B / analo	/ g 15-pip D-s	hall			OPTION	S	
Security		Power-o	n passwo	rd / adminis	strator passwo	ord /	2				SDRAM DIMM	33L5037 33L5038
Software <sup>9</sup>		ServerG	uide™ (C		ooot / unattend tillation and co others		1 1	GB PC2 8.2GB	2100 CL2.5 I5K Ultra16	ECC DDR-SI 50 SCSI SL 68	DRAM RDIMM 8-pin HDD	33L5036 33L5039 06P5765 06P5751
Keyboard / m Cooling fans		None sta Five fans power st	s (three fa	ins for syste	em, one blowe ed / not redund	r in rear, one	e on 7	36.4GB <sup>2</sup> 3.4GB <sup>2</sup> Remote	15K Ultra16 10K Ultra16 Superviso	60 SCSI SL 66 60 SCSI SL 66 60 SCSI SL 66 r Adapter Ultra160 SCS	8-pin HDD 8-pin HDD	06P5751 06P5766 06P5752 09N7585 06P5740
Power supply Prerequisites	<b>S</b> .	supports not redu Appropri monitor,	dual inpundant / no ate do po	ut sources ( ot hot-swap wer source	irect current] (two power so / auto-restart and customer ick with perfor	urces) / support supplied wi	sing / I I I ring, N	BM T54 BM Net BM Net NetBAY	1 15" Flat BAY25 Sta BAY42 En ACT Loca	Panel Color andard Rack terprise Racl I Console Ma	Monitor (black	9512AB1 9306250 930842S 1735L04



**Back** 

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

Bay ① 3.5", UltraSlim 0.5", access Bay ② 5.25", UltraSlim 0.5", access, Bay ③ 3.5", SL 1", no acces Bay ④ 3.5", SL 1", no acces access, 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

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

• 3 year IOR 9x5, NBD avg response (ServicePac® part num 69P9505)

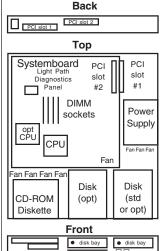
• 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9506)

3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9507)

• 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9508)

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

IBM® Type-model Qty x P		L2 FSB cache MHz	Memory	Memory type	Disk	Disk controller	Hot -swap or fixed disk bays		Limit Ethernet warra		Available date
8830-61X 1 x Xeon 8830-62X 1 x Xeon 8830-81X 1 x Xeon 8830-82X 1 x Xeon 8830-11X 1 x Xeon 8830-12X 1 x Xeon	2.4GHz 5 2.8GHz 5	512KB 400 512KB 400 512KB 400	512MB 512MB 512MB 512MB	Chipkill	None (open) 40GB <sup>2</sup> EIDE None (open) 40GB <sup>2</sup> EIDE None (open) 40GB <sup>2</sup> EIDE	Ultra320 EIDE Ultra320 EIDE Ultra320 EIDE	2 hot-swap 2 fixed 2 hot-swap 2 fixed 2 hot-swap 2 fixed	2x4 2x4 2x4 2x4 2x4 2x4	2 x Gigabit 1 ye 2 x Gigabit 1 ye	ear <i>l</i> ear l ear l	Aug 2002 Nov 2002 Nov 2002 May 2003
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel® X 512KB / on 2-way SMP Systemboar	Keon 2.4, 2.8, o die of processo V up to two Xeo	or 2.8BG r / at proc n Process Intel 603-	<b>Hz</b> ¹ with 4 essor spec sors (same pin micro-	.00MHz or 533 ed (no L3 cach e speed/cache PGA ZIF socke	BMHz front e) size) ets, four me	tside bus / Hyp	er-Thre	ce-constrained eleading technology	/	
Memory	PC2100 266 must be inst Error Check	talled in matche	l 184-pin d pairs [a cting (E(	ECC DDR bank] / 2-v <b>CC)</b> via <b>16</b>	-SDRAM DIMN way memory in -bit Checksun	Ms / four D terleave /	dual čhannel / r	nemory	ots on systemboa bus runs at 2 x 1 bit errors on sam	MOC	Hz/
SCSI disk controller  IDE controller / cable  Disk - capacity  Disk - bays	64-bit 100M one 16-bit ir All: Enhance EIDE mode SCSI mode	MHz PCI-X Bus I nternal channel ced IDE ATA-10 els: One 2-drop I els: none standa	3 / suppo / 16-bit 6 0 controll EIDE cab rd / suppo	rts <b>RAID-</b> 68-pin LVE er in CSB le to two c orts up to	1 mirroring (E 0 cable from sy 5 South Bridge lisk bays / one 15000 rpm disl	mbedded stemboar two con 1-drop El ks; EIDE r	Mirroring) with d to backplane nectors on plan DE cable to CD models: 40GB/	two SC for two ar / one -ROM 7200 rp	B/sec) / on plana SI disks in front b disks / no externa 1-drop IDE cabl om / ATA-100 / 8. II HD bays Ultra	ays al co e (C 7ms	nnector D-ROM) seek
Mechanical Architecture / chipset	s <b>ServerWor</b> one CIOB-X slot 2 and U SMBus, LPC	X2 I/O Bridae (II	mpion™ MB2 bus South B I/O) / Nat	<b>4.0 LĖ</b> / C to Host Br ridge (Thir ional Sem	CMIC LE Host E idge for PCI-X n IMB to Host E iconductor® P(	Bridge (me Bus A wit Bridge for C87417 St	emory controlle h slot 1 and dua PCI 2.2 Bus C	r and I/e al ether		ıs B EIDI	with E, USB,
Ethernet controllers  CD-ROM / diskette Rear ports Front ports / graphics Console interconnect	on planar / F 24X-10X <sup>6</sup> C Rear: one l Front: two l s C2T Interco	PCI-X 64-bit 100 D-ROM / IDE; I USB (Vers 1.1), USB (Vers 1.1);	MHz Bus Diskette: C2T in, C Graphic: 10 inch, 2	s A / full du 3.5" 1.44N 22T out, se s: SVGA / !45mm) is	plex / Wake on IB diskette driv erial (9-pin), tw ATI® Rage XL, standard (Key	n LAN® / AÌ re / dust co ro ethernet r/ on plana rboard Vid	ert Standard Fover (RJ-45), one R r / 8MB SDRAN eo Mouse (KVN	ormat 1. S-485 ( I std/ma M) chair	ning cable) / one (	por aralle PCI	ts el port 2.2 bus
Systems mgmt  Diagnostics	monitoring s with 20-pin of Light Path		nemory, c for contin (LED ligh	ptional dis luous pwr ts indicate	sks, fàns, pówe (no ext pwr req failing	er supply / Xeon Xeon	support for op 2.4GHz/512KE 2.8GHz/512KE	tional R 3 L2 Ca 3 L2 Ca	ystem and environ demote Supervisco ache Proc Upg ache Proc Upg Cache Proc Upg	r Ad	
Security Software	unattended ServerGuio	oassword / admi l boot / selectabl <b>de</b> ™ (CD-ROM i M Director™, an	e boot / u nstallatio	nattended	l start mode	512M 1GB I 2GB I 80GB	B PC2100 CL2 PC2100 CL2.5 PC2100 CL2.5 ATA-100 EID	.5 ECC ECC D ECC D E HDD	DDR-SDRAM Ď DR-SDRAM RDII DR-SDRAM RDII	MM MM	33L5039
Cooling fans Power supply Prerequisites	variable spe 332 watt / u Monitor, key one Cable C	five for system, eed / not redur universal / auto yboard, mouse, Chain Technolo CT CAT-5 chaini	ndant or I o-sensing rack, disl gy (C2T)	not-swap / auto-re k (some), Kit per cha	start support operating sys,	73.4G Remo xSerie break NetBA	B 10K-4 Ultra16 te Supervisor A es Cable Chair	60 SCS Adapter Techr meter k Console	l Hot-Swap SL HD nology Cable Kit KVM chaining cab Manager	D* (2 n ole)	06P5756 09N7585 neter



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 Drack 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): 292GB with two 146GB SL SCSI disks or 240GB with two 120GB EIDE disks

See footnotes for important warranty information

• = Hot-swap in some models

us models announced February18, 2003; previous models on August 20, 2002 and November 19, 2002

(X3351) © IBM Corp. December 2002

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

International Warranty Service<sup>3</sup> On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays,

next business day response time7

eligible locations):<sup>7</sup>
• 3 year IOR 9x5, NBD response
(ServicePac® part num 69P9505)

(ServicePac part num 69P9506)

(ServicePac part num 69P9507)

(ServicePac part num 69P9508)

24x7<sup>14</sup> toll-free support for warranty

issues during the warranty period<sup>3</sup>

On site service upgrade options (in

3 year IOR 9x5, 4 hr avg response

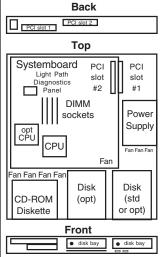
3 year IOR 24x7, 4 hr avg response

3 year IOR 24x7, 2 hr avg response

1 year parts and labor

△ 533Mhz FSB models may use 400Mhz FSB processors. 400Mhz FSB models may not use 533Mhz FSB processors.

IBM <sup>®</sup> Type-model Qty x P	L2 rocessor cache	Memory type		Disk controller	Hot -swap or fixed disk bays		Slots x bays	Ethernet	Limited warranty <sup>3</sup>	Available date
< 8676-41X 1 x Xeon <sup>1</sup> < 8676-42X 1 x Xeon 8676-61X 1 x Xeon 8676-62X 1 x Xeon	2.0GHz 512KB 2.4GHz 512KB	512MB Chiple 512MB Chiple	kill™None (open kill 40GB² EIDE kill None (open kill 40GB EIDE	EIDE Ultra320	2 hot-swap	1U rack	2x4 2x4	2 x Gigab 2 x Gigab 2 x Gigab 2 x Gigab	it 3 year it 3 year	Aug 2002 Aug 2002
Positioning Processor(s) L2 cache SMP support Implementation	A highly manageable 1 x Intel® Xeon 2.0 512KB / on die of pre 2-way SMP / up to the Systemboard contains of the contains of th	or 2.4GHz <sup>1</sup> wirecessor / at proc wo Xeon Proces ins two Intel 603	th 400MHz front cessor speed (no sors (same spee -pin micro-PGA 2	side bus / L3 cache) d/cache siz IF sockets	Hyper-Threadi ze) , four memory I	ing techr	nology			
Memory	512MB std / 8GB n PC2100 266MHz re must be installed in Error Checking an detects 2- through 8	gistered 184-pin matched pairs [a d Correcting (E	ECC DDR-SDR bank] / 2-way m <b>CC)</b> via <b>16-bit C</b> l	AM DIMMs emory inte hecksum (	:/four DIMM go rleave/dual ch	annel/n	nemory	bus runs a	t 2 x 100N	1Hz/
SCSI disk controller  IDE controller / cable  Disk - capacity  Disk - bays	All (not used on EIL 64-bit 100MHz PCI one 16-bit internal All: Enhanced IDE EIDE models: One SCSI models: two h	-X Bus B / suppo channel /16-bit ATA-100 control 2-drop EIDE cal standard / supp	orts <b>RAID-1 mirr</b> 68-pin LVD cable ler in CSB5 Sout ble to two disk ba orts up to 15000	oring (Emerican system) or Bridge / 1 or Bri	bedded Mirrori emboard to bac two connectors drop EIDE cab ; EIDE models	ng) with ckplane for plane for concept to CD : 40GB /	two SC for two ar / one -ROM 7200 rp	SI disks in disks/ no e 1-drop IDI om / ATA-1	front bays xternal co E cable (C	nnector CD-ROM) s seek
Mechanical Architecture / chipsets Bus slots	EIA 19" Rack (1U <sup>4</sup> ) s ServerWorks® Gra one CIOB-X2 I/O B slot 2 and Ultra320 SMBus, LPC bus to (See below) two av	and Champion™ ridge (IMB2 bus / CSB5 South E o Super I/O) / Na	<sup>4</sup> <b>4.0 LE</b> / CMIC I to Host Bridge for Bridge (Thin IMB tional Semicond	LE Host Bri or PCI-X B to Host Bri uctor® PC8	idge (memory ous A with slot 1 dge for PCI 2.2 17417 Super I/O	controller and dua 2 Bus C v	r 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		4-bit 100MHz Bu / IDE; <i>Diskette:</i> ers 1.1), C2T in, ( ers 1.1); <i>Graphic</i> cable (10 inch, )	s A / full duplex / 3.5" 1.44MB disł C2T out, serial (\$ ss: SVGA / ATI® F 245mm) is stand	Wake on L kette drive / 9-pin), two / Rage XL / c ard (Keybo	AN® / Alert Star / dust cover ethernet (RJ-45 on planar / 8MB pard Video Mou	ndard Fo 5), one R SDRAM use (KVM	rmat 1. S-485 ( std/ma 1) chair	0 / two rear sys mgmt) ax / 32-bit 3 ling cable)	RJ-45 po / no parall 3MHz PC / one Cab	rts lel port l 2.2 bus
Systems mgmt  Diagnostics	IBM Integrated sys monitoring such as with 20-pin conn on Light Path Diagno component) and on	temp, memory, planar for conti stics™ (LED ligh	optional disks, fa nuous pwr (no ex nts indicate failin	ins, power it pwr req) g	Xeon DP 2.0	ort for opt GHz/512 GHz/512	ional Ř 2KB L2 2KB L2	emote Sup Cache Pro Cache Pro	ervisor A c Upg c Upg	
Security Software	Power-on password unattended boot / so <b>ServerGuide™</b> (CD utilities), IBM Direct	electable boot / ι )-ROM installatio	inattended start on and configurat	mode ion	1GB PC2100 2GB PC2100 80GB ATA- 36.4GB 15K	0 CL2.5   0 CL2.5   100 EIDE Ultra320	ECC D ECC D SCSIH	DR-SDRAN DR-SDRAN *	A RDIMM A RDIMM	33L5039 33L5040 09N4226 06P5776
Cooling fans Power supply Prerequisites	Eight fans (five for s variable speed / no 332 watt / universa Monitor, keyboard, one Cable Chain Te NetBAY ACT CAT-	of redundant or al / auto-sensing mouse, rack, dis echnology (C2T) 5 chaining soluti	hot-swap g / auto-restart s k (some), opera Kit per chain of	ting sys, servers or	Remote Sup ServeRAID <sup>TI</sup> IBM T541 15 xSeries Cab breakout cat NetBAY ACT * Disk not sup	M-4Mx UI 5" Flat Pa le Chain ble and2 Γ Local C	tra 160 inel Col Techno meter h	lor Monitor blogy Cable (VM chaini Manager	(black) Kit (2 me	



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",
Bay ④ 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

S US models announced August 20, 2002; withdrawn effective April 29, 2003

Utility tray in front slides out from under middle bay (USB devices)
H1.72" (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

240GB with two 120GB EIDE disks / supports 15K rpm SCSI disks

## Maximum internal disk capacity<sup>13</sup> (model dependent): 146.8GB with two 73.4GB SL SCSI disks or

See footnotes for important warranty information

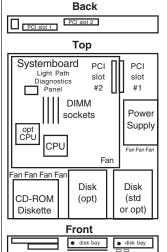
- = Hot-swap in some models

#### **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 time<sup>7</sup> 3 year on site warranty service upgrade options (in eligible
- locations):
  - 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response
  - (ServicePac® part num 21P2072) 24 hr x 7 day coverage, 4 hour average response
  - (ServicePac part number 21P2073) 24 hr x 7 day coverage,
  - 2 hour average response (ServicePac part number 21P2074)
- Other ServicePac options at ibm.com/services/its/us/ source/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty
  - issues during the warranty period3

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IBM® Type-model Qty x Pr	ocessor o		SB //Hz Memo	Memory ry type	Disk	Disk controller	Hot -swap or fixed disk bays	Slots x bays	Ethernet		Available date
8676-71X 1 x Xeon 8676-72X 1 x Xeon 8676-81X 1 x Xeon 8676-82X 1 x Xeon 8676-11X 1 x Xeon 8676-12X 1 x Xeon	2.6GHz 5 2.8GHz 5 2.8GHz 5 2.8B GHz 5	512KB 4 512KB 4 512KB 4 512KB 5	400 512N 400 512N 400 512N 533≰ 512N	B Chipkill™ IB Chipkill IB Chipkill IB Chipkill IB Chipkill IB Chipkill	M None (open) 40GB <sup>2</sup> EIDE None (open) 40GB <sup>2</sup> EIDE None (open) 40GB <sup>2</sup> EIDE	Ultra320 EIDE Ultra320 EIDE Ultra320 EIDE	2 fixed 2 hot-swap 2 fixed	2x4 2x4 2x4 2x4 2x4 2x4 2x4	2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi 2 x Gigabi	t 3 year t 3 year t 3 year t 3 year	Aug 2002 Nov 2002 Nov 2002 May 2003
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel® 2 512KB / on 2-way SMP Systemboa	Xeon 2.6, die of pro / up to tw ard contain	2.8 or 2.8B cessor / at processor Processor Seon Processor Processor National Processor Processo	GHz¹ with 4 ocessor spe essors (sam )3-pin micro	erver that delive 100MHz or 533 eed (no L3 cach ne speed/cache -PGA ZIF socke ethernet, graphi	MHz front e) size) ets, four m	side bus / Hyp	er-Threa	ading techn	ology	
Memory	PC2100 26 must be ins Error Chec	6MHz reg stalled in m cking and	istered 184-p natched pairs	in ECC DDI [a bank] / 2 ( <b>ECC)</b> via <b>1</b> 0	o slots availabl R-SDRAM DIMI -way memory ir 6-bit Checksun o chips)	Ms / four D iterleave /	dual channel / ı	memory	bus runs at	2 x 100N	/lHz/
SCSI disk controller  IDE controller / cable	64-bit 100N one 16-bit i All: Enhance	MHz PCI-X internal ch ced IDE A	Bus B / suple annel / 16-b     TA-100 contile	ports <b>RAID</b> it 68-pin LV oller in CSE	3C1020 / Ultra3 -1 mirroring (E D cable from sy 35 South Bridge disk bays / one	mbedded stemboar two con	Mirroring) with d to backplane nectors on plar	two SC for two ar / one	SI disks in f disks / no e:	ront bay: xternal c	onnector
Disk - capacity Disk - bays	SCSI mode	e <i>ls:</i> none s	standard / su	oports up to	15000 rpm dis onnectors / fille	ks; <i>EIDE r</i>	nodels: 40GB /	′7200 rp			
Mechanical Architecture / chipset Bus slots	s <b>ServerWor</b> one CIOB-X slot 2 and U SMBus, LP	rks® Gran X2 I/O Brid Ultra320 / PC bus to S	i <b>d Champio</b> i dge (IMB2 bi CSB5 South Super I/O) / N	n™ <b>4.0 LE</b> / us to Host B i Bridge (Th lational Sen	orted in 26" dee CMIC LE Host I ridge for PCI-X in IMB to Host I niconductor® P0 swap Active™ I	Bridge (me Bus A wit Bridge for C87417 S	emory controlle h slot 1 and du PCl 2.2 Bus C	er and I/0 al ether	O Bridge) / net and PCI	-X Bus E	
Ethernet controllers  CD-ROM / diskette Rear ports Front ports / graphics Console interconnect	on planar / l 24X-10X <sup>6</sup> C <i>Rear:</i> one <i>Front:</i> two s C2T Interco	PCI-X 64-I DD-ROM / USB (Vers USB (Vers onnect™ c	bit 100MHz E IDE; <i>Disketi</i> s 1.1), C2T ir s 1.1); <i>Grapi</i> able (10 incl	Bus A / full d e: 3.5" 1.44l I, C2T out, s Inics: SVGA II, 245mm) is		n LAN® / AÌ re / dust co ro ethernet / on plana rboard Vid	ert Standard Fo over t (RJ-45), one F r / 8MB SDRAN eo Mouse (KVI	ormat 1. RS-485 ( Il std/ma VI) chair	0 / two rear sys mgmt) / ix / 32-bit 33 ing cable) /	RJ-45 po no paral MHz PC one Cab	erts lel port I 2.2 bus
Systems mgmt  Diagnostics	monitoring with 20-pin <b>Light Path</b>	such as te conn on p Diagnost	emp, memor planar for cor tics™ (LED li	v, optional d Itinuous pw ghts indicat	essor (ISMP) / isks, fans, power (no ext pwr req e failing C-Doctor in BIO	er supply / ) Xeon Xeon		tional R B L2 Ca B L2 Ca	emote Supe ache Proc l ache Proc l	ervisor A Jpg Jpg	
Security Software	unattended ServerGui	d boot / sel <b>de</b> ™ (CD-l	/ administrat ectable boot ROM installa r™, and othe	/ unattende tion and cor	d start mode	512M 1GB 2GB 80GB	B PC2100 CL2. PC2100 CL2.5 PC2100 CL2.5 3 ATA-100 EID	5 ECC I ECC D ECD' E HDD'	DDR-SDRAM DR-SDRAM DR-SDRAM	A RÖIMM RDIMM RDIMM	33L5038 33L5039 33L5040 09N4226
Cooling fans Power supply Prerequisites	variable sp 332 watt / Monitor, ke one Cable	eed / not universal yboard, m Chain Tec	nouse, rack,	or hot-swap ng / auto-re disk (some) T) Kit per ch		Remo Serve xSeri break or NetB	BB 15K Ultra32lote Supervisor A PRAID™-4Mx Uses Cable Chair Cout cable and AY ACT Local	Adapter Iltra160 n Techr 2M KVI Consol	SCSI Adapt lology Cabl M chaining Manager	er e Kit (2N	06P5776 09N7585 06P5736 1 06P4792 1735L04



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): 292GB with two 146GB SL SCSI disks or 240GB with two 120GB EIDE disks

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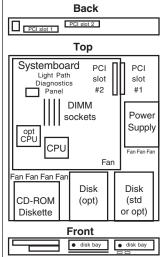
See footnotes for important warranty information

- = Hot-swap in some models
- us models announced February18, 2003; previous models on November 19, 2002

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

IBM® Type-model Qty x Pr	ocessor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Hot -swap o		Ethernet		Available date
8676-1AX 1 x Xeon	2.8B GHz	512KB	533	512MB	Chipkill	None (open)					it 3 year	Mar 2003
	er models nt to sup					tructures req	uiring ne	twork				
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel 512KB / 2-way SI Systemb	Xeon 2 on die of p MP / up to oard cont	2.8BGHz processo two Xeo ains two	1 with 530 or / at process on Process Intel 603-	3MHz from essor spe sors (sam pin micro	erver that deliventside bus / Heed (no L3 cache speed/cache-PGA ZIF sockethernet, graph	yper-Threa ne) e size) ets, four m	iding technol	ogy			
Memory	PC2100 a must be i Error Ch	266MHz r nstalled ir <b>ecking a</b>	registered n matche <b>nd Corre</b>	d 184-pin d pairs [a <b>ecting (E</b> 0	ECC DDF bank]/2-	o slots availab R-SDRAM DIM -way memory i 6-bit Checksu o chips)	Ms / four D nterleave /	dual channel	/ memory	y bus ruńs a	2 x 100N	ΛHz/
SCSI disk controller	64-bit 10 one 16-b	0MHz PC it internal	I-X Bus channel	B / suppo / 16-bit 6	rts <b>RAID</b> - 88-pin LV	C1020 / Ultra 1 mirroring (ED cable from s	Embedded ystemboai	Mirroring) w d to backplar	th two Sone for two	CSI diśks in disks / no e	front bays	onnector
IDE controller / cable Disk - capacity Disk - bays	EIDE mo	dels: One dels: non	e 2-drop ie standa	EIDE cab rd / supp	le to two orts up to	35 South Bridge disk bays / one 15000 rpm dis onnectors / fille	e 1-drop El sks; <i>EIDE l</i>	DE cable to models: 40GI	CD-ROM 3 / 7200 r	pm / ATA-1	00 / 8.7m:	s seek
Mechanical Architecture / chipset	s <b>ServerW</b> one CIOI slot 2 and SMBus, I	orks® Gi 3-X2 I/O I d Ultra320 _PC bus t	r <b>ánd Cha</b> Bridge (II 0 / CSB5 to Super	ampion™ MB2 bus 5 South B I/O) / Nat	4.0 LE/( to Host B ridge (Thi ional Sen	orted in 26" dee CMIC LE Host ridge for PCI-> in IMB to Host niconductor® P swap Active™	Bridge (m K Bus A wit Bridge for C87417 S	emory contro th slot 1 and o PCI 2.2 Bus	ller and I dual ethe	′O Bridge) / rnet and PC	I-X Bus E	
Ethernet controllers CD-ROM / diskette Rear ports Front ports / graphics Console interconnect	on planar 24X-10X' <i>Rear:</i> or <i>Front:</i> tw s C2T Inte	· / PCI-X ( · CD-ROM · OUSB (\ · OUSB (\ · rconnect	64-bit 100 M / IDE; /ers 1.1); /ers 1.1); ™ cable (	OMHz Bus Diskette: C2T in, C Graphic 10 inch, 2	s A / full di 3.5" 1.44N 22T out, s <i>s:</i> SVGA / 245mm) is	dcom BCM570 uplex / Wake o MB diskette driv serial (9-pin), tv / ATI® Rage XL s standard (Ke n (a cable with:	n LAN® / A ve / dust co vo etherne . / on plana yboard Vid	lert Standard over t (RJ-45), one r / 8MB SDR, leo Mouse (K	Format 1 RS-485 AM std/m VM) chai	.0 / two rear (sys mgmt) ax / 32-bit 3: ning cable)	RJ-45 pc / no paral 3MHz PC / one Cab	orts lel port I 2.2 bus
Systems mgmt  Diagnostics	monitoring with 20-p	ng such a in conn c	s temp, n on planar	nemory, o for contir	optional di nuous pwi	essor (ISMP) / isks, fans, pow r (no ext pwr rec ate failing cor	rer supply r q)	support for	optional F	Rémote Sup	ervisor A	dapter
Security				` `	r passwo		· /		OP	TIONS		/
Software		uide™ (C	D-ROM i	installatio	n and con	d start mode ifiguration	512M 1GB	2.8BGHz/51 B PC2100 CL PC2100 CL2	2.5 ECC .5 ECC [	DDR-SDRAI DR-SDRAI	M DIMM 1 RDIMM	33L5039
Cooling fans					n power		36.40	PC2100 CL2 3B 15K Ultra	320 SCSI	Hot-Swap S		33L5040 06P5776



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

332 watt (-48 to -60 V dc [direct current]) / auto-sensing

Monitor, keyb., mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5

supports dual input sources (two power sources) /

not redundant / not hot-swap / auto-restart support

variable speed / not redundant or hot-swap

- 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): 292GB with two 146GB SL SCSI disks or 240GB with two 120GB EIDE disks

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

09N7585

06P5736

06P4792

1735L04

3 year parts and labor

Remote Supervisor Adapter ServeRAID™-4Mx Ultra160 SCSI Adapter

NetBAY ACT Local Console Manager

Cable Chain Technology (C2T) Cable Kit (2 meter

breakout cable and 2 meter KVM chaining cable)

- 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
- ibm.com/services/its/us/ source/wamomxeu.pdf
- 24x714 toll-free support for warranty issues during the warranty period3

See footnotes for important warranty information

Power supply

Prerequisites

us models announced February18, 2003

<sup>=</sup> Hot-swap

@ 501 701								X111_1	B, 000.	ver riela okiii	o Enablem	crit ream
IBM®	L2		Memory		SCSI			Slots	x bays	Power		Available
		e Memory	type	Disk	controller	Mechani	ical			supply	Ethernet	date
8670-11X 1 x Xeon 8670-21X 1 x Xeon 8670-31X 1 x Xeon	2.2GHz 512K	(B 512MB (B 512MB (B 512MB	Chipkill™ Chipkill Chipkill	None	2 x Ultra32	.0 2U ra	ick 5	5x8 (6	hot-swap	o)1 x hot-swap o)1 x hot-swap o)1 x hot-swap	2 x Gigabi	t Jul 2002
Positioning Processor(s) L2 cache SMP support Implementation	A rack-dense 2-w 1 x Intel® Xeon 512KB / on die of 2-way SMP / up Systemboard con slot for standard F	Processor / processor / to two Xeon tains two Int	o <b>r 2.0, 2.2,</b> at process n MP Proc el 603-pin	or 2.4 or spee essors micro-P	GHz <sup>1</sup> with 4 d (no L3 cac (same spec GA ZIF sock	DOMHz fi he) d/cache tets, four	ronts size mer	side bu e) mory D	us / Hype	r-Threading ted	chnology e PCI-X slots	
Memory	512MB std / 8GB PC2100 266MHz must be installed i Error Checking a detects 2- through	registered 1 n matched p <b>ınd Correct</b>	84-pin ECo pairs [a bar r <b>ing (ECC)</b>	C DDR- nk] / 2-w via <b>16-</b> l	SDRAM DIN ay memory bit Checksu	IMs / foui nterleave	r DIN e / d	ИМ gol ual cha	d-connections of the design of	tor slots on systemory bus runs	temboard / [ at 2 x 100M	DIMMs Hz/
SCSI disk controller SCSI channels	LSI Logic® 53C10 supports RAID-1 shared with option Two 16-bit channel	<b>mirroring</b> ( nal IBM Ser els (one inte	Embedded veRAID™- ernal and o	l Mirrori 5i Cont ne exte	ing) with up t roller for low rnal) / <i>SCSI</i>	o one ho -cost RA <i>Channel</i>	t-sp ID 0 <i>I A:</i> 1	are dis , 1, 1E I6-bit 6	sk / , 5, 00, 10 8-pin LV[	), 1E0, 50 (insta Cable from sy	alled only in	Slot 2) to
IDE controller / cable Disk - capacity Disk - bays	backplane for six VHDCI connector Enhanced IDE AT None standard / s Six hot-swap / 80-	/ supports A-100 cont upports 720	optional Se roller in CS 00-15000 r	erveRÅ SB5 Soo pm disk	ID adapters uth Bridge / o ss / one back	with exte one conn plane	erna ecto	l conne or on pl	ector(s) anar / one	e 1-drop IDE ca	able (CD-RC	
Mechanical Chipset	EIA 19" Rack (2U ServerWorks® G two ClOB-X2 I/O controllers; IMB2 CSB5 South Brid USB, SMBus, LP (See below) Four	rand Cham Bridges (IM bus to Host ge (Thin IMI C bus to Su	pion™ 4.0 B2 bus to I Bridge for B to Host E per I/O) / N	LE/Cl Host Br PCI Bu Iridge fo IS PC8	MIC LE Hos idge for PCI us B with slo or PCI 2.2 bu 7417 Super	Bridge (Bus A wits 3 and als C with I/O	mer ith lo 4 on slot	mory co ow prof riser o 5 (on i	ontroller a file slots 1 card) / riser card	and I/O Bridge) , 2, and Ultra3: ) and graphics	/ 20 and ethe controller, E	
Ethernet controller CD-ROM / diskette Rear ports Front port / graphics	Two gigabit 10/10 on planar / PCI-X 24X-10X <sup>6</sup> CD-RO Rear: two USB (\) no parallel port	64-bit 100M M / IDE; <i>Dis</i> /ers 1.1), ke	Hz / full du skette: 3.5" eyboard, m	plex / W 1.44Ml ouse, s	Vake on LAN B diskette dr erial (9-pin),	Alert Size / Al	Stan cov (DB	dard Forer er 3-15), to	ormat 1.0 wo ethern	/ two RJ-45 po et (RJ-45), two	rts in rear RJ-45 (sys	mgmt) /
Security	Power-on passwo	,,										
Systems mgmt  Diagnostics	IBM Integrated s H8S2148 / on plan monitoring such a supports optional connector on rise Light Path Diagn	ystem man nar / provide is temp, opt Remote Su r for continu	agement pes system a ional disks pervisor Acious power	oroces and env , fans, p dapter v	sor (ISMP) / vironmental bower supp / vith 20-pin t power requ	Xeon Xeon Xeon 512M ) 1GB	DP DP DP B P PC2	2.0GF 2.2GF 2.4GF 2.4GF 2100 C	Iz/512KB Iz/512KB Iz/512KE O CL2.5 E CL2.5 EC	L2 Cache Prod L2 Cache Prod B L2 Cache Prod ECC DDR-SDFA C DDR-SDRAI C DDR-SDRAI	c Upg oc Upg RAM DIMM M RDIMM	33P293 33P293 37L353 33L503 33L503 33L503
Software	failing part (under ServerGuide™ (Cutilities), IBM Dire	top cover) / CD-ROM ins	Information tallation ar	n LED F nd confi	Panel in front	IBM :	Ser\ Rem	reRAID	0-5i Conti upervisor	roller (adapter Adapter (PCI O SCSI Hot-Sw	for slot 2) adapter)	25P349 09N758
Keyboard / mouse Power supply	None standard (be Std: one 350 watt All: rear access / worldwide / v	ecause rack t / hot-swap redundant	c-based) ; <i>Max:</i> two with two p	350 wa		73.40 146.8 350W NetB	GB 1 GB V Ho AY	10K-5 8 10K-5 8 ot-Swa 250mn	30 Ultra32 30 Ultra32 p Power n KVM C	0 SCSI Hot-Swa 0 SCSI Hot-Swa Supply (with the conversion Option	vap SL HDD ap SL HDD nree fans)	32P072 32P0728 59P405 32P163
Fans Prerequisites	Std: five fans; Ma power supply All: variable spec Monitor, keyboard	x: eight (thr r) / redundan ed / hot-swa	ee fans wit It with eight Ip / PFA	h option fans ins		NetB. Other	AY r op	Remot	at ibm.co	Manager e Manager o <b>m</b> /pc/us/acces uired when ins		1735L0 1735R1 040
Slot 1: low-profile, 6 Slot 2: low-profile, 6 Slot 3: full, 64-bit 13 Slot 4: full, 64-bit 13	34-bit 100MHz 3.3v 34-bit 100MHz 3.3v 33MHz 3.3v PCI-X,	PCI-X, not I PCI-X, not I not hot-swa	hot, Bus A hot, Bus A* ap, Bus B	Quic     Con     Diag	figuration/Se	tup Utility Doctor™	y: F1 ): F2	at star 2 at sta	tup rtup	LIMITED 3 year parts a International V	Narranty Se	rvice <sup>3</sup>

Slot 5: half, 32-bit 33MHz 5v PCI 2.2, not hot-swap, Bus C\*\*
\* Extended slot for optional IBM ServeRAID-5i Controller \*\* Primarily for optional Remote Supervisor Adapter

 Opt disk Opt disk 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", Bay ⑤ 3.5", SL 1", Bay ⑥ 3.5", SL 1", Bay ⑥ 3.5", SL 1", Bay ⑥ 3.5", SL 1", access, std diskette access, std CD-ROM access, hot-swap, open for disk Bays 3 through 8 support six SL disks via SCA-2 connectors

Network Boot: F12 at startup LSI Logic Configuration Utility: CTRL+C at

Front indicators LEDs: Power-on LED, SCSI bus activity LED,

system identification LED information LED, and 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"

Stealth black color

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

- coverage excluding holidays, next business day response time
- 3 year on site warranty service upgrade options (in eligible locations):7
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac® 21P2077)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
  - 2 hour average response time (ServicePac 21P2093)

    Other ServicePac options at
  - ibm.com/services/its/us/ source/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

(X345) © IBM Corp. July 2002

2U

Rack

J @ 201 V01	ACC1100		. ,	,			жиш. Бу об	CIVEI I ICIG OKII		one rouni
IBM® Type-model Qty x	Processor	L2 cache Memory	Memory type	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays		Ethernet	Available date
	on™ 2.67GHz on 2.8BGHz	512KB 512MB 512KB 512MB			2 x Ultra320 2 x Ultra320	) 2U⁴ rack ) 2U rack	5x8 (6 hot-sw 5x8 (6 hot-sw	/ap)1 x hot-swap /ap)1 x hot-swap	2 x Gigabit 2 x Gigabit	Feb 2003 Feb 2003
Positioning Processor(s) L2 cache SMP support Implementation	1 x Intel® Xe 512KB / on die 2-way SMP / Systemboard	on™ Processor e of processor / a up to two Xeon contains two Inte	2.67 or the process of the process o	2.8BGH or spee essors micro-P	<b>dz</b> 1 with 533N d (no L3 cach (same speed CGA ZIF socke	MHz frontsi ne) d/cache siz ets, four me	ide bus / Hype :e) emory DIMM slo	r application-semer-Threading technots, two low-profil SCSI, ethernet, g	inology e PCI-X slots	
Memory	PC2100 266M must be insta Error Checkin	IHz registered 18 Iled in matched r	4-pin EC0 pairs [a ba n <b>g (ECC)</b>	C DDR- ank] / 2 via <b>16-</b> l	SDRAM DIMI -way memor bit Checksur	Ms / four DI v interleave	IMM gold-conne e / dual channe	lies required whe ector slots on sys el / memory bus , 3, or 4-bit errors	temboard/E runs at 2 x	DIMMs 133MHz /
SCSI disk controller SCSI channels  IDE controller / cable Disk - capacity Disk - bays	supports RAII shared with op Two 16-bit chat backplane for VHDCI conne Enhanced IDE None standard Six hot-swap	D-1 mirroring (E btional IBM Serve annels (one inter six disks; Chanic ctor / supports of E ATA-100 contro d / supports 7200 / 80-pin SCA-2 co	mbeddede eRAID™-! nal and o nel B: 16- ptional Se oller in CS 0-15000 rp onnectors	Mirrori 5i Conti ne exte bit 68-p erveRA 8B5 Sou om disk	ing) with up to roller for low- rnal) / SCSI ( in interface to ID adapters v uth Bridge / or is / one backp	o one hot-sp cost RAID ( Channel A: co support e with externa ne connect plane ed in each	pare disk / 0, 1, 1E, 5, 00, 16-bit 68-pin L external SCSI d al connector(s) for on planar / c disk bay / all di	one 1-drop IDE c isk bays Ultra320	alled only in ystemboard t nal SCSI 0.81 able (CD-RC )-enabled	Slot 2) to mm
Mechanical Chipset	ServerWorks two CIOB-X2 controllers; IM CSB5 South E USB, SMBus,	. <sup>®</sup> <b>Grand Champ</b> I/O Bridges (IMB IB2 bus to Host I Bridge (Thin IMB LPC bus to Sup	oion™ 4.0 2 bus to l 3ridge for to Host B er I/O) / N	LE / Cl lost Br PCI Bu ridge fo IS PC8	MIC LE Host idge for PCI E us B with slots or PCI 2.2 bus 7417 Super I	Bridge (me Bus A with I s 3 and 4 o s C with slo O	emory controlle low profile slots n riser card) / ot 5 (on riser ca	no rack to tower of er and I/O Bridge) s 1, 2, and Ultra3 urd) and graphics ot-swap Active™	20 and ethe	
Ethernet controller CD-ROM / diskette Rear ports Front port / graphics	on planar / PC 24X-10X <sup>6</sup> CD- Rear: two US no parallel por	I-X 64-bit 100MH ROM / IDE; <i>Disk</i> B (Vers 1.1), key t	Iz / full du kette: 3.5" board, m	plex / W 1.44MI ouse, se	/ake on LAN® B diskette driv erial (9-pin), g	/ Alert Star /e / dust co raphics (Di	ndard Format 1 ver B-15), two ethe	rnet MAC and PH I.0 / two RJ-45 pc ernet (RJ-45), two M std/max / 32-bit	orts in rear RJ-45 (sys i	mgmt) /
Security	Power-on pas	sword / administ	rator pass	sword /	unattended b	oot / select	table boot sequ	uence		
Systems mgmt	IBM Integrate H8S2148 / on monitoring su- supports optic	ed system mana planar / provides ch as temp, optio anal Remote Sup riser for continuo	gement possible size system a contract of the	oroces and env , fans, p dapter v	sor (ISMP) / vironmental bower supp / vith 20-pin	Xeon DI Xeon DI 512MB 1GB PC	P 2.67GHz/51; P 2.8BGHz/51 PC2100 CL2.5 22100 CL2.5 E	2KB L2 Cache F 2KB L2 Cache I 5 ECC DDR-SDI ECC DDR-SDRA ECC DDR-SDRA	Proc Upg RAM DIMM M RDIMM	71P8966 71P8967 33L5038 33L5039 33L5040
Diagnostics Software	Light Path Dia failing part (un ServerGuide	agnostics™ pand der top cover) / Ir ™ (CD-ROM insta Director systems	el providir nformatior allation ar	ng LED n LED F nd confi	map to Panel in front	IBM Ser IBM Rer IBM T54	rveRAID-5i Co note Supervisc 41 15" Flat Pa	ontroller (adapter or Adapter (PCI a nel Color Monito 1320 SCSI Hot-St	for slot 2) dapter) or (black)	25P3492 09N7585 9512AB1
Keyboard / mouse Power supply	Std: one 350 All: rear acce	d (because rack- watt / hot-swap; ess / redundant w	<i>Max:</i> two vith two po	ower su		146.8GB 350W H	3 10K-5 80 Ultra lot-Swap Powe	320 SCSI Hot-Sv 320 SCSI Hot-Sw er Supply (with t Conversion Optic	ap SL HDD hree fans)	32P0727 32P0728 59P4057 32P1636
Fans Prerequisites	Std: five fans; power su All: variable s	e / voltage-sensi <i>Max:</i> eight (thre pply) / redundant speed / hot-swap oard, mouse, SC	e fans wit with eight ) / PFA	h optior fans ins		NetBAY NetBAY Other o	Local Console Remote Conso ptions at <b>ibm.</b>	Manager <sup>'</sup>	ssories	1735L04 1735R16
Slot 1: low-profile, 6 Slot 2: low-profile, 6 Slot 3: full, 64-bit 13 Slot 4: full, 64-bit 13 Slot 5: half, 32-bit 33 * Extended slot for 0	64-bit 100MHz 3 64-bit 100MHz 3 33MHz 3.3v PC 33MHz 3.3v PC 3MHz 5v PCI 2. optional IBM Se	B.3v PCI-X, not ho B.3v PCI-X, not ho I-X, not hot-swap I-X, not hot-swap, rveRAID-5i Cont	ot, Bus A ot, Bus A* o, Bus B o, Bus B Bus C** roller		figuration/Set Inostics (PC-I em Partition E vork Boot: F12 Logic Configu	up Utility: È Doctor™): F Boot: ALT+l 2 at startup	1 at startup 2 at startup F1 at startup	LIMITED	Warranty Sel - 5 pm, Mon luding holida response tir	rvice <sup>3</sup> - Fri ays, next ne <sup>7</sup>

Slot 5: half,32-bit 33MHz 5v PCI 2.2, not hot-swap, Bus C \* Extended slot for optional IBM ServeRAID-5i Controller \*\* Primarily for optional Remote Supervisor Adapter

 Opt disk Opt disk 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", Bay ⑤ 3.5", SL 1", Bay ⑥ 3.5", SL 1", Bay ⑥ 3.5", SL 1", Bay ⑥ 3.5", SL 1", access, std diskette access, std CD-ROM access, hot-swap, open for disk Bays 3 through 8 support six SL disks

information LED, and system-error LED Predictive failure analysis on disk options, memory, processors, VRMs, power

SCSI bus activity LED,

system identification LED,

supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure

Front indicators LEDs: Power-on LED,

Rack: H 3.36" x W 17.5" x D 27.5"

startup

2U

Rack

Stealth black color

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

- business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):7
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac® 21P2077)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
  - 24 hr x 7 day coverage,
     2 hour average response time (ServicePac 21P2093)
  - Other ServicePac options at ibm.com/services/its/us/ source/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

via SCA-2 connectors

IBM <sup>®</sup> Type-model Qty x P	rocessor	L3 cache	Memory	Disks	SCSI controller	Mechan- ical		RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapte	Available r date
8686-7RX 1 x Xeon 1 8686-8RX 2 x Xeon 1 8686-9RX 2 x Xeon 1	MP 1.9GHz	1MB 1MB 2MB	1GB Chipkill™ 2GB Chipkill 2GB Chipkill	None None None	Ultra160 Ultra160 Ultra160		6x5 6x5 6x5	One One One	One (not redun) Two redundant Two redundant	PCI	Dec 2002 Dec 2002 Dec 2002
Positioning Processors L2 cache L3 cache Processor upgrade Implementation	1 or 2 x Inte 512KB / on 0 1MB or 2MB 4-way SMP Systemboar	el® Xeon die of pro B / on die / up to fo d contair	y, 3U, rack-dense  M Processor MP ocessor / at proce of processor / at vur Xeon Processor s four Intel 603-p ethernet, graphic	1.5, 1.9, or ssor speed processor spors MP (sam in micro-PG	r 2.0GHz <sup>1</sup> v peed ne speed/ca	vith 400M che size)	Hz fron	tside bus	/ Hyper-Thread	ing tecl	
Memory	one memory 128-bit simu Error Check	board st Itaneous <b>(ing and</b>	GB max <sup>13</sup> / two (1 tandard with 8 DII transfer from two Correcting (ECO bit errors contained	MM gold-cor DIMMs / P C) via <b>16-bit</b>	nnector slot C1600 200l t <b>Checksun</b>	s / DIMMs MHz regis	must be tered 18	e installe 34-pin DD	d in matched pai R-SDRAM RDIN	rs / /IMs /	
SCSI disk controller SCSI connectors SCSI cabling IDE controller / cabling Disk - capacity Disk - bays	Controller ha One standar SCSI RAID a Enhanced ID None standa	ard-wired d 16-bit l adapter 6 DE ATA-3 ard / supp	Wide Ultra160 St I to SCSI backpla LVD cable include 88-pin connector of 33 controller in OS ports up to 15,000 1/ converged tray	ne (no cable ed for attachi on systembo BB4 South B rpm disks	e) / no extéri ing an optio pard for this tridge	nal ŠCSI o nal Serve cable to g	connecto RAID ac	or dapter to t	he three-bay ba	ckplane	.
Mechanical	EIA 19" racl	k models	<b>s (3U</b> 4 <b>)</b> x 28" deep	o / supported	<sup>′™</sup> Racks	(such as	s NetBAY	42 SR, NetBAY4	12 ER)		
Chipset  Slots (Active™ PCI-X)	IBM XA-32™ chipset / IBM Memory I/O Controller (improved performance from earlier models) with two remote I/O ports (one to IBM PCI-X Host Bridge; one to RXE Expansion Port) / IBM PCI-X Host Bridge provides three peer PCI buses (two PCI-X 1.0, one PCI 2.2) / PCI 2.2 Bus 0 supports SCSI, graphics, ethernet, adapter slot with Remote Supervisor Adapter, ServerWorks® OSB4 South Bridge (IDE, USB, ISA bus for Super I/O NS PC97317VUL [diskette, keyboard, mouse]) 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										es (two dapter, and ])
RXE Expansion Port			up to 12 additio						mote Expansio	n Encl	osure
CD-ROM / diskette Ethernet Graphics controller Ports	Intel 82559 1 SVGA / S3 <sup>®</sup> Rear: RXE-1	10/100 et Savage 00 Expai	3.5" 1.44MB disk thernet controller 4 LT / on systemb nsion Port (to con ard, mouse, analo	/ on system oard / 8MB nect optional	SDRAM sto I RXE-100),	l/max / up RXE Man	to 1280 agemer	0x1024 at nt Port (to	64K colors at 85 manage optional	5Hz I RXE-1	00), two
Security	Power-on ar	nd admin	istrator password	s / unattende	ed boot / se	lectable b	oot				
Systems management Diagnostics	console and Light Path I IBM Real Tir	mgmt / p <b>Diagnos</b> t ne Diagn	ower on/off syster tics™ / primary in ostics (operated	n / monitors dicator on in	power statu formation p	is, op syst anel with	em, tem LEDs as	perature, ssociated	disks, fans, pow	er supp	olies
Software	ServerGuid	<b>e</b> ™ (CD-l	server running ROM installation a r, and others	and configur	ation	256ME 512ME	PC160 PC160	0 ECC DI 0 ECC DI	DR SDRAM RDII DR SDRAM RDII SDRAM RDIMN	MM	33L3281 33L3283 33L3285
Keyboard / mouse Power supplies	Std: one or to redundant w	wo 370 v ith two po oltage-s	use rack-based) vatt hot-swap; <i>Ma</i> ower supplies (so sensing / auto-resi upply / PFA	me configur		Xeon N Xeon N Xeon N 370 wa	/IP 1.5G /IP 1.9G /IP 2.0G .tt Hot-S	Hz/1MB l Hz/1MB l Hz/2MB l wap Redi	.3 Cache Proc U .3 Cache Proc U .3 Cache Proc U undant Power Su Jltra160 SCSI Ac	pg pg pg pply	59P6815 59P6816 59P6817 31P6108 06P5736
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 73.4GB 10K UI IBM NetBAY42 Star IBM Integrated xSer IBM T541 15" Flat P								OK Ultra16 2 Standar xSeries /	60 SCSI Hot-Swa d Rack (SR) Adapter for iSerie	s S	06P5756 9306420 1519100 9512AB1
Six available 3.3 volt A									<b>n</b> /pc/us/accesso		3312AD1
- or two fullsize, 64-t - or two fullsize, 64-t - or two fullsize, 64-t - or two fullsize, 64-t •Bus 1 (A) with four sl	pit, 133MHz Po pit, 100MHz Po pit, 66MHz Po pit, 66MHz Po pit, 33MHz Po pit, 66MHz Po pit, 66MHz Po pit, 66MHz Po pit, 33MHz Po	CI-X, hot- CI-X, hot- CI-X, hot- CI, hot- CI, hot- slots 3, 4, CI-X, hot- CI, hot-	swap bimen: swap bimen: swap bienen: swap bienen: swap bienen: swap bienen: swap bienen: biene	sions: H5.25 sions: H133 : 58.4 to 70lt black color ee serviceab adapters, p board from t power supp rogram by p stics (PC-Doelect by pres	.4mm x W4- bs; 24.9 to 3 dility processors, a dop blies and dis pressing F1 octor) by pre	42.0mm x 11.8kg memory, a sks from fr at startup essing F2	and ont at startu	⇒ 3 ye ⇒ Inte ⇒ On co nex ⇒ On (in o	LIMITED WA ear parts and lab ernational Warra site, 8 am - 5 pm overage excludir t business day r site service upg eligible locations year IOR 24x7, 4	nty Ser nty Ser n, Mon ng holic espons rade or s): <sup>7</sup>	vice <sup>3</sup> - Fri days, se time <sup>7</sup> otions

64-bit, 33MHz PCI, not hot-swap ♀ • Disk ③ • Disk 4

- only for standard Remote Supervisor Adapter

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

- <u>Diagnostics</u> (PC-Doctor) by pressing F2 at sta
   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 the parent 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

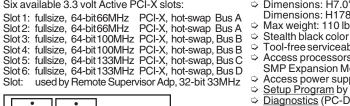
All models: Maximum internal disk capacity: 220.2GB with three 73.4GB2 hot-swap SCSI disks

- 3 year IOR 24x7, 4 hr avg response (ServicePac® part num 21P2078)
   3 year IOR 24x7, 2 hr avg response
  - (ServicePac part num 21P2093) · 4 year IOR 9x5, NBD response
  - (ServicePac part num 69P9258) • 5 year IOR 9x5, NBD response
  - (ServicePac part num 69P9262) · Other ServicePac options at
- ibm.com/services/its/us/ source/wamomxeu.pdf 24x7<sup>14</sup> toll-free support for warranty

IBM <sup>®</sup> Type-model Qty x	Processor	SMP Exp Modules		L4 cache	Memory	Disk	SCSI controller	Mech- anical	Slots x bays	Hot-swap pwr supplies		Available date
8687-3RY 2 x Xeor 8687-4RY 4 x Xeor			None None	32MB 64MB	2GB Chipkill™ 4GB Chipkill					Two redundar Two redundar		
Positioning Processors L2 cache L3 cache L4 cache Processor upgrade SMP Expansion Modules Additional boards	2 or 4 x Int 512KB eac None / on o 3RY: 32MB 32MB in ea 3RY: 4-wa 8-way SMP 3RY: one s cache, sixte Ports) / eac One I/O Boo	tel® Xeon h process lie of proc ; 4RY: 64 ch SMP E y SMP with with two: td; 4RY: td een DIMM h SMP Ex ard (PCI-)	or/on essor/ MB; A/ ixpansi th two s SMP E wo sto socke cpansic ( Host	die of portion die of portion die of portion die on Mode SMP Expansion die on Mode to the on Mode Bridge.	server consolia MP 2.4GHz¹ wit rocessor / at pro essor speed (op  I™ Server Acce ule / ECC / 64-bi cansion Module n Modules or up o max / each co SMP Expansio le activates one SCSI, ethernet, PCI-X slots), one	th 400M cessor stional Xolerator (it 400Mbs; All: moto 16-wortains for Ports (RXE Exgraphics	Hz frontside bespeed (optional eon MP has 5 Cache / Hz bus from Cache say SMP in the four Intel 603-persecond modules, South Bridge Specond Portions, South Bridge	ous / suppal Xeon M 12KB or 1 ache and upgraded e third qua ion micro-1 ule connec (only one le, Super	oorts Hy IP has 2 MB in e Scalabi to Xeor arter 200 PGA ZIF cted via RXE Ex	yper-Threading 156KB in each processor lity Controller in MP processor 22 with two xSe = sockets for X one or two SM spansion Ports for Mamt Adag	orocesson  rs to supperies 440 eon, 32N P Expansupporte oter), one	pport up to 0 systems MB L4 usion ed)
Memory	4RY: 4GB s All: Each s 4-way interl Correcting	std with 8 SMP Expa eaving / P ( <b>ECC) ar</b>	x 512 ansion C133- nd Chi	MB DIM Module complia <b>pkill™ v</b>	Ms / 16MB max Ms (4 DIMMs ir has 16 DIMM g nt / 3.3v register ia <b>Memory Pro</b> <b>nory</b> ™ via mem	n eàch S old-conr ed 168- teXion <sup>†</sup>	SMP Exp Mod nector slots / n pin SDRAM R M (1, 2, 3, or 4	dule) / <b>32</b> 0 nust instal RDIMMs / -bit errors	GB max II four id 133MHz on sam	c <sup>13</sup> / entical DIMMs z / <b>Error Check</b> ne chip; up to tv	at same t <b>ing and</b> vo chips	i
SCSI disk controller SCSI implementation IDE controller Disk - capacity/bays	First channe second char one standar Enhanced I	el to interr nnel to on rd (longer) DE ATA-1	nal 2-po e exter ) 16-bit l 00 cor	ort SCSI nal .8mr LVD ca ntroller in	50 SCSI (LVD 1) backplane for in n VHDCI 68-pin ble included for n South Bridge / 5K rpm SCSI di	nternal h connect attachin one one	ot́-swap disks or (16-bit LVD g an optional : e-drop IDE cab	s (16-bit L\ cable from ServeRAI ole to bacl	/D cable m I/O Bo D adapt kplane f	e to SCSI backp pard to ext conn ter to the two-ba or diskette and	olane) / ector) / ay backp CD-RO	olane M
Mechanical	EIA 19" rac	k models	AY™ Racks (s	uch as Ne	tBAY42	SR, NetBAY4	2 ER)					
Chipset  Slots (Active™ PCI-X  RXE Expansion Port	IBM Memor provides thr VIA® 82C68 PCI 2.2 Bus ) Six hot-swa hot replace One port to	y I/O Control Gee peer P GGB South GF suppor PPCI-X 1 F, hot upg Support	troller v CI buse Bridge ts SCS .0 slots grade, l up to	vith two es / PCI e (IDE AT SI, etherr s <sup>10</sup> availa hot exp 12 addi	ansion / separa tional PCI-X slo	(each to orts grap oper I/O F A, B, C, I and atten ted by ir ots via a	o a IBM PCI-X hics, adapter s PC97317VUL D support PCI- tion indicator l asulative plast n optional IB	Host Brid slot with R [keyboard -X slots / d lights (opt ic dividers M RXE-1	ge) / ead lemote s l, mouse designed ical sens s 00 Rem	ch IBM PCI-X F Supervisor Ada e]) / d to the PCI-X 1 sors control pov ote Expansion	lost Brid pter, .0 speci wer to slo	ge fication ot) / sure
CD-ROM / diskette Ethernet Graphics controller Ports	Broadcom® SVGA / S3® Rear: RXE-	5700 10/ Savage4 100 Expar	100/10 Pro / c nsion P	00 ether on I/O Bo Port (to c	iskette drive / bo rnet controller / c pard / 8MB SDR/ pnnect optional I rnet / no serial o	on I/O Bo AM 125N RXE-100	oard / full dupl //Hz std/max / )), RXE Manag	lex / 64-bi up to 128 gement Po	t 66MHž 0x1024 ort, two l	z PCI bus / Wal at 64K colors a USB (Vers 1.1)	ke on ĹA t 85Hz	N®
Security	Power-on a	nd admini	strator	passwo	rds / unattended	boot/se	electable boot					
Systems mgmt					adapter / include tem / monitors p							
Diagnostics	Light Path	Diagnost	ics™/	primary	indicator on info	ormation	panel with LE	EDs assoc	ciated w	ith failing comp	onents /	(
Software		de™ (CĎ-l	ROMir	stallatio	ed through IBM [ n and configura		xSeries S	essors 2.4	GHz/51	odule with Dual 2KB L2 Cache	7	P 1P7919 9P5188
Keyboard / mouse Power supplies  Cooling fans  Six available 3.3 volt	watts at 110 front access fans in each Four hot-sw one addition fan failure s	ax: two / h Ov / redund s / worldw n power su vap, redun nal fan in e ignals Dia	not-swa dant at ide / vo upply / idant, r each p	ap / 1050 220v wi oltage-se PFA nulti-spe ower su	) watts at 220v of the two power subsensing / auto-reseated fans /	pplies / start /	Xeon MP Xeon MP Xeon MP 512MB P 1GB PC1 IBM 73.44 8X/4X/24 IBM T540	1.4GHz/5 1.5GHz/5 1.6GHz/1 C133 ECC 33 ECC S GB 10K U X Max CD ) 15" Flat F	512KB L 512KB L MB L3 ( C SDRA 5DRAM Itra160 ( Panel Co	3 Cache Proc L 3 Cache Proc L Cache Proc Up M RDIMM	Jpg 3 Jpg 3 g 3 3 0 0 ack) 9	2P8705 2P8706 2P8706 2P8707 3L3324 1P8300 6P5756 2P9101 511AG4
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 Remc	66MHz PCI 66MHz PCI 100MHz PCI 100MHz PCI 133MHz PCI 13	-X, hot-swX, hot-swX, hot-swX, hot-swX, hot-swX, hot-swAdp, 32-bi  4U F  ette (Ultra ROM (Ultra swap	ap Bus ap, Bus ap, Bus ap, Bus ap, Bus it 33MF	D M S T A S A S D S Ir o d P X p (2000)	imensions: H7.0 imensions: H17.0 imensions: H17 lax weight: 110 l tealth black colo ool-free services ccess processor MP Expansion Nccess power supetup Program briagnostics (PC-ICSISelect by proformation LED put Light Path par isagnostics without redictive Failure ceL4 Server Accower supplies, and Manadels: Max 46.8GB with two	8mm x Nos; 50kg r sholling r sholling r sholling r sholling r sholling r should be sho	DOT'X D27.5" W483mm x D6 DOTY, adapters, rom top Ind disks from f Ing F1 at startup DOTY pressing F2 Strl+A at startup DOTY pressing F2 Ing Cover) So alerts on pr Cache, memoisks with IBM Internal disk ca	and front p at startup bible pull- cocessors, ory, fans, Director pacity:	⇒ 1 ⇒ 1 ⇒ 1 ⇒ 0 ⇒ 2 ⇒ 1 up lo	LIMITED WAyear parts and ternational Wa n site, 24 hr x 7 ame day responyear on site way a respons. The way cations): 7 24 hr x 7 day c 2 hour respons (No Service Pac os available x 7 day c 1 toll-free s arranty issues arranty period a site of the way arranty period arranty p	ARRAN labor rranty S day co nse time irranty s in eligib overage e time available aintenar le upport f during t	ervice <sup>3</sup> verage, yr service ole s, h control one

8687-4RX 2 x Xeon™ MP 1.5GHz 1MB 32MB 2GB Chipkill™ None 2xUltra160 4U⁴ rack 6x4 3/1 Two redundant PCI Nov 2002 8687-5RX 2 x Xeon MP 1.9GHz 1MB 32MB 2GB Chipkill None 2xUltra160 4U rack 6x4 3/1 Two redundant PCI Nov 2002 8687-6RX 4 x Xeon MP 1.9GHz 1MB 32MB 4GB Chipkill None 2xUltra160 4U rack 6x4 3/1 Two redundant PCI Nov 2002 8687-7RX 4 x Xeon MP 2.0GHz 2MB 32MB 2GB Chipkill None 2xUltra160 4U rack 6x4 3/1 Two redundant PCI Nov 2002 8687-7RX 4 x Xeon MP 2.0GHz 2MB 32MB 2GB Chipkill None 2xUltra160 4U rack 6x4 3/1 Two redundant PCI Nov 2002 Positioning Processors    Processors   Up to 8-way power for high-end databases, server consolidation and mission-critical business applications 2 or 4 x Intel® Xeon™ Processor MP 1.5, 1.9, or 2.0GHz¹ with 400MHz frontside bus / supports Hyper-Threading technology 12 cache 12 x Xeon MP 2.0GHz¹ with 400MHz frontside bus / supports Hyper-Threading technology 12 cache 13 x Xeon™ Processor / at processor speed													
8887-8FM 2 x Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx		Processor		Memory	Disk							ailable date	
Processors Locache Loc	8687-5RX 2 x Xeon 8687-6RX 4 x Xeon	MP 1.9GHz MP 1.9GHz	1MB 32MB 1MB 32MB	2GB Chipkill 4GB Chipkill	None None	2xUltra160 2xUltra160	4U rack 4U rack	6x4 6x4	3/1 3/1	Two redundant Two redundant	PCI Nov	v 2002 v 2002	
16 DIMM gold-connector slots / must install four indentical DIMMs at same time / 4-way interfeaving / PC133-compliant / 3.3 Mr z giver of Checking and Correcting (CC) and Chipkill with Memory Protexion* (1, 2, 3, or 4-bit errors or same chip), up to two chips at once; redundant bit steering) / Portago in the month of the month o	Processors L2 cache L3 cache L4 cache Processor upgrade SMP Expansion Module	2 or 4 x Intel® 512KB each 1MB or 2MB 32MB XceL4 32MB in each 4-way SMP ( One SMP Ex L4 cache, six Ports) / each One I/O Boar	PXeon™ Process processor / on each processor, ™ Server Accelon SMP Expansion up to 8-way SMF panion Module teen DIMM sock SMP Expansion d (PCI-X Host B)	die of process do n die of process do n die of process erator Cache on Module / ECC with optional std / two max ets, three SMP Module activa ridge, SCSI, eti	or 2.0Gi sor / at p cessor / a (up to 64) C / 64-bit SMP Exp / each co P Expans tes one F hernet, g	Hz¹ with 400 processor s at processor s t processor MB with option 400 MHz but the processor ontains four ion Ports (seax Expansiraphics, So	MHz fronts peed speed ional SMP is from Car dule) Intel 603-p econd mod sion Port (d uth Bridge	Expansible bus  Expansible and another ano	/ support sion Mod d Scalabil o-PGA Z nnected v e RXE Ex d I/O, slot	s Hyper-Threadiule) / ity Controller IF sockets for X ia one or two S pansion Port s for Mgmt Adap	ng technolog (eon MP, 32 MP Expans upported) ter), one	2MB sion	
SCSI implementation   First channel to internal 2-port SCSI backplane for internal hof-swap disks (16-bit LVD cable from LVD Cobard for 10 Deard to ext connector)	Memory	16 DIMM gold 3.3v register Memory Pro	d-connector slots ed 168-pin SDR <b>teXion</b> ™ (1, 2, 3	/ must install f AM RDIMMs / , or 4-bit errors	four inder / 133MH s on same	ntical DIMM: z / <b>Error C</b> e chip; up to	s at same hecking a two chips	time / 4 and Co at once	I-way inte orrecting e; redund	erleaving / PC13 (ECC) and C	33-complian hipkill™ via	nt /	
Chipset  IBM XA-32" chipset / IBM Cache and Scalability Controller with L4 cache controller and three SMP Expansion Ports / IBM Memory I/C Controller with two remote I/C ports (each to a IBM PCIX Host Bridge) / each fills MPCIX Host Bridge provides three peer PCI buses / PCI2.2 Bus E supports graphics, adapter slot with IBM PCIX Adapter, PCIX 10 stocks with provided to the provided provided three peer PCI buses / PCIZ 2 Bus E support (p. 10-373 pm PCI (keyboard, mouse))  RXE Expansion Port Support to Support to Support (p. 10-373 pm PCI (keyboard, mouse))  RXE Expansion Port To support up to 12 additional PCIX Six hot reviews pCIX 1.0 stocks a additional PCIX Six hot reviews pCIX 1.0 stocks a additional PCIX Six hot reviews pCIX 1.0 stocks a support up to 12 additional PCIX stots via an optional IBM RXE-100 Remote Expansion Enclosure  CD-ROM / diskette  Ethemet  Ethemet  Ethemet  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay** 2000 bays / supports CD-RW, DVD Broadcontroller  Ports  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay** 2000 bays / supports CD-RW, DVD Broadcontroller  Ports  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay** 2000 bays / supports CD-RW, DVD Broadcontroller  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay** 2000 bays / supports CD-RW, DVD Broadcontroller  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay** 2000 bays / supports CD-RW, DVD Broadcontroller  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay*** 2000 bays / supports CD-RW, DVD Broadcontroller  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay*** 2000 bays / supports CD-RW, DVD Broadcontroller  24X-10X° CD-ROM 3.5 *1.44MB diskette drive / both removable from Ultrabay*** 2000 bays / supports CD-RW, DVD Broadcontroller  24X-10X° CD-ROM 3.5 *1.44MB CD-ROM 3.5 *	SCSI implementation	ation 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 connecto											
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 slow themetor Supervisor Adapter, I/A* 82C688B South Bridge (IDE ATA-100, USB, Super I/O PC97317VUL [keyboard, mouse]) / PCI-2.2 Bus F supports SCSI, ethernet PCI-X 1.0 slots** available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / Point place, not upgrade by insulative plastic dividers place of the PCI-X 1.0 slots* available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade by insulative plastic dividers place in the PCI-X 1.0 slots* and point place in the PCI-X 1.0 slots* available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade by insulative plastic dividers place in the PCI-X 1.0 slots* available PCI-X 1.0 slots* available PCI-X 1.0 slots* available with power and attention indicator lights (optical sensors control power for slots) / hot replace hot place and power for power slots and power power slots. Available available even while server running sensors control power for slots of the power slots of the p	Mechanical	EIA 19" rack	etBAY42	SR, NetBAY42	ER)								
RXE Expansion Port  One port to support up to 12 additional PCLX slots via an optional IBM RXE-100 Remote Expansion Enclosure  Ethernet Ethernet Broadcom* 5700 10/100/1000 ethernet controller / on I/O Board / full duplex / 64-bit 66MHz PCl bus / Wake on LAN* SVGA / S3* Savage4 Pro / on I/O Board / 8MB SDRAM 125MHz std/max / up to 1280/1024 at 64K colors at 85Hz Rear RXE-100 Expansion Port (to connect optional RXE-100), RXE Management Port, two USB (Vers 1.1)  Security Power-on and administrator passwords / unattended boot / selectable boot  Systems mgmt Diagnostics  Remote Supervisor Adapter / PCl adapter / includes 10/100 ethermet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies Light Path Diagnostics ** Unique path of the path path path path path path path path	·	IBM XA-32™ 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 in the power and attention indicator lights (optical sensors control power to slot) /											
CD-ROM / diskette Ethemet Ethemet Ethemet Ethemet Ethemet Ethemet Ethemet Ethemet Erondom* 5700 10/100/1000 ethemet controller / on I/O Board / full duplex / 64-bit 68MHz PC 1bus / Wake on LAN* Graphics controller Forts Fo	RXE Expansion Port									ote Expansion	Enclosure	<b>.</b>	
Remote Supervisor Adapter / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power or/off system / monitors power status, op system, temperature, disks, fans, power supplies Light Path Diagnostics "/ primary inclicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running Server Guide** (CD-ROM installation and configuration utilities), IBM Director, and others  Keyboard / mouse Power supplies   Ethernet Graphics controller	Broadcom® 5 SVGA / S3® S Rear: RXE-10	700 10/100/1000 Savage4 Pro / on 00 Expansion Pol	O ethernet cont I/O Board / 8M rt (to connect o	troller / oi IB SDRA ptional R	n I/O Board M 125MHz s XE-100), R>	/ full duple std/max / u KE Manage	x / 64-b p to 128 ement F	oit 66MHz 80x1024 : Port, two U	: PCI bus / Wak at 64K colors at JSB (Vers 1.1),	e on LAN® : 85Hz			
console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies light Path Diagnostics / primary indicator on information panel with LEDs associated with failing components / Series SMP Expansion Module 59P5188 ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others  Keyboard / mouse Power supplies  Keyboard / mouse Power supplies  None standard (because rack-based)  Std: two; max: two / hot-swap / 1050 watts at 220v or 550 watts at 110v / redundant at 220v with two power supplies / front access; worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA  Cooling fans  Six available 3.3 volt Active PCI-X shot-swap Bus A 50t2: fullsize, 64-bit 100MHz PCI-X, hot-swap Bus A 50t3: fullsize, 64-bit 100MHz PCI-X, hot-swap Bus B 50t3: fullsize, 64-bit 130MHz PCI-X, hot-swap Bus B 50t3: fullsize	Security	Power-on and	d administrator pa	asswords / unat	ttended b	oot / selecta	ble boot						
available even while server running ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others  Keyboard / mouse Power supplies  None standard (because rack-based) Std: two; max: two / hot-swap / 1050 watts at 220v or 550 watts at 110v / redundant at 220v with two power supplies / front access / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA  Cooling fans  Cooling fans  Six available 3.3 volt Active PCI-X slots: Six available 3.3 volt Active PCI-X slots: Six available 3.3 volt Active PCI-X, hot-swap Bus A Slot 2: fullsize, 64-bit 66MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swa		console and r Light Path D	ngmt / power≀on/ iagnostics™ / pi	off system / mo rimary indicato	nitors po r on infor	wer status, or mation pane	op system el with LEI	tempe Os asso	rature, dis ciated wi	sks, fans, powe th failing compo	r supplies onents /		
Power supplies  Std: two; max: two / hot-swap / 1050 watts at 220v or 550 watts at 110v / redundant at 220v with two power supplies / front access / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA  Cooling fans  Cooling fans  Cooling fans  Cooling fans  Six available 3.3 volt Active PCI-X slots:  Six available 3.4 volt Active PCI-X slots:  Six available 3.5 volt Active PCI-X slots:  Six available 3.6 d-bit 66MHz  Slot 2: fullsize, 64-bit 100MHz PCI-X, hot-swap Bus A Slot 3: fullsize, 64-bit 130MHz PCI-X, hot-swap, Bus B Slot 3: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot used by Remote Supervisor Adp, 32-bit 33MHz  Access processors, memory, adapters, and SMP Expansion Module from top Slots: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot: used by Remote Supervisor Adp, 32-bit 33MHz  Access processors, memory, adapters, and SMP Expansion Module from top Scoling fans  Access processors, memory, adapters, and SMP Expansion Module from top Scolit fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot: used by Remote Supervisor Adp, 32-bit 33MHz  Access processors, memory, adapters, and disks from front Setup Program by pressing F1 at startup Diagnostics (PC-Doctor) by pressing F2 at startup Diagnostics (PC-Doctor) by pressing F2 at startup Uniformation LED panel and front-accessible pull-out Light Path panel (1st and 2nd level diagnostics without removing cover)  All models: Maximum internal disk capacity:  All models: Maximum internal disk capacity:  All models: Maximum internal disk capacity:		available eve ServerGuide utilities), IBM	n while server ru ™ (CD-ROM inst Director, and oth	nning tallation and co ners		on S	512MB PC 1GB PC13	133 EC 3 ECC	C SDRAI SDRAM I	M RDIMM RDIMM	33L33 31P8	324 300	
Six available 3.3 volt Active PCI-X slots:   Siot 1: fullsize, 64-bit 66MHz   PCI-X, hot-swap Bus A Slot2: fullsize, 64-bit 60MHz   PCI-X, hot-swap, Bus B Slot3: fullsize, 64-bit 100MHz   PCI-X, hot-swap, Bus B Slot5: fullsize, 64-bit 100MHz   PCI-X, hot-swap, Bus B Slot5: fullsize, 64-bit 133MHz   PCI-X, hot-swap, Bus B Slot6: fullsize, 64-bit 133MHz   PCI-X, hot-swap, Bus B Slot7: fullsize, 64-bit 133MHz   PCI-X, hot-swap, Bus B Slot6: fullsize, 64-bit 133MHz   PCI-X, hot-swap, Bus B Slot7: fullsize, 64-bit 133MHz   PCI-X, h	Power supplies	Std: two; max watts at 110v front access / fans in each p	x: two / hot-swap / redundant at 2 / worldwide / volt bower supply / P	/ 1050 watts a 20v with two po age-sensing / a FA	ower sup auto-rest	550   5 pplies /   1 art /   1	Xeon MP 2 BM 73.4G BM Serve	0GHz/ B 10K l RAID™-	2MB L3 ( Jltra160 S -4H Ultra	Cache Proc Up SCSI Hot-Swap 160 SCSI Adapt	59P5 06P5 er 37L68	173 756 889	
Slot 1: fullsize, 64-bit 66MHz Slot 2: fullsize, 64-bit 66MHz Slot 3: fullsize, 64-bit 100MHz PCI-X, hot-swap Bus A PCI-X, hot-swap, Bus B Slot 3: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 7: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus B Slot 7: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 8: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B Slot 9: fullsize, 64-bit 100MHz PCI-X, hot-swap 9: full 100 fullsite form top International Varranty Service 9: full 100 fullsite form top International Varranty 9: full 100 fullsite form top International Varranty 9: full 1	Coolingfans						BM T540	15" Flat	Panel Co	olor Monitor (bla		AG4	
Supply Supply out Light Path panel (1st and 2nd level diagnostics without removing cover)  Dot disk ● Opt dis	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	C, hot-swap Bus A C, hot-swap Bus A C, hot-swap, Bus B C, hot-swap, Bus B C, hot-swap, Bus C C, hot-swap, Bus D dp, 32-bit 33MHz	Dimension  Max weigl  Stealth bid  Tool-frees  Access pr  Access pr  Access pr  Diagnostic  SCSISele  Information	ns: H178 ht: 110 lb ack color serviceab cocessors ansion M ower supp gram by cs (PC-D ct by pres on LED pa	x W19.0" x mm x W483 s; 50kg bility s, memory, a odule from to blies and dis pressing F1 octor) by pre- ssing Ctrl+A anel and fron	D27.5" Bmm x D69 adapters, a bp lks from fro at startup lessing F2 at at startup lat-accessib.	9mm nd ont at startu	⇒ 1 ⇒ Ir ⇒ 0 ss ⇒ 1 u	LIMITED WA year parts and iternational Wa in site, 24 hr x ' ame day respo year on site wa pgrade option ocations):' 24 hr x 7 day c	RRANTY <sup>3</sup> labor irranty Serv 7 day cover nse time <sup>7</sup> arranty serv (in eligible overage,	vice³ rage,	
	Opt disk • Opt disk u CD-RO  Bay ① 3.5", 0.5", Bay ② 3.5", 0.5", Bay ③ 3.5", SL 1",	access, disket access, CD-R access, hot-sv	tte (Ultrabay 2000 OM (Ultrabay 200 vap	diagnostic Predictive XceL4 Se power sup IBM Direc  All mode	es withour Failure A rver Acce oplies, an tor Is: Maxi	t rèmoving c Analysis® ale elerator Cac d optional di mum interna	over) erts on pro- he, memor isks with al disk cap	y, fans,	⇔ P S; ⇔ 2. w w	(No ServicePac ost warranty m ervices availab 4x7 <sup>14</sup> toll-free s varranty issues	available) aintenance le upport for during the		

mile 2, contains and contains a														
IBM <sup>®</sup> Type-model Qty x	Processor		L4 ache	Memory	Disk	SCSI controller				SMP/RXE Exp Ports			Mgmt dapte	Available r date
<ul> <li>8687-1AX 2 x Xeo</li> <li>8687-2AX 2 x Xeo</li> <li>8687-3AX 2 x Xeo</li> <li>8687-5AX 2 x Xeo</li> <li>8687-5AX 2 x Xeo</li> <li>8687-5AX 2 x Xeo</li> </ul>	n MP 1.5Ghz n MP 1.6Ghz n MP 1.5GHz n MP 1.9GHz	512KB 3 1MB 3 1MB 3 1MB 3	2MB 2MB 2MB 2MB	0GB Chipkill™ 0GB Chipkill 0GB Chipkill 0GB Chipkill 0GB Chipkill 0GB Chipkill	None None None None	2xUltra16 2xUltra16 2xUltra16 2xUltra16 2xUltra16 2xUltra16	0 4U 0 4U 0 4U 0 4U	J rack J rack J rack J rack	6x4 6x4 6x4 6x4 6x4 6x4	3/1 3/1 3/1 3/1	Two Two Two Two	redundant redundant redundant redundant redundant redundant	PCI PCI PCI PCI	Jul 2002 Jul 2002 Jan 2003 Jan 2003
Processors L2 cache L3 cache L4 cache Processor upgrade SMP Expansion Module Memory	512KB each Up to 2MB ea 32MB XceL4 <sup>T</sup> 32MB in each 4-way SMP (u One SMP Exp L4 cache, sixt Ports) / each S 0GB std / 160 16 DIMM gold 3.3v registere Memory Prot	processor ach proces MServer A SMP Expa proper to 8-way panion Mo een DIMM SMP Expar GB max (u -connector d 168-pin S eXion™ (1	/ on cosor / ccele insion / SMP dule sockension / p to 3 solts SDRAI, 2, 3,	MP 1.5, 1.9, or die of processo on die of proce rator Cache (up Module / ECC/ with optional SI std / two max / ets, three SMP Ed Module activate 2GB with option / must install for M RDIMMs / 13: or 4-bit errors o	r / at pessor / p to 64Ibit 64-bit MP Expeach co Expansis one F nal SM ur inder 3MHz / n same	processor s at process MB with opt 400MHz bu pansion Mo- intains four ion Ports (s 8XE Expansi IP Expansi IP Expansi Error Chee e chip; up to	peed or sp ional is froi dule) Intel econ- sion F on Ma s at s cking two	leed SMP Em Cach 603-pind modu Port (or odule) same ti g and C chips a	expansion microlle confidence of the confidence	sion Modi d Scalabil ro-PGA ZI nnected v e RXE Ex o DIMMs i-way inte cting (EC	ule) / ity Co F soo ia on pans insta rleav <b>C) ar</b>	ckets for Xe e or two SM ion Port sup lled / ing / PC133 nd Chipkill	on MF IP Expoporte 3-com	P, 32MB pansion ed)
SCSI disk controller SCSI implementation IDE controller Disk - capacity/bays	Adaptec® AIC- First channel t second channone standard ( Enhanced IDE	-7899W / V to internal 2 el to one ex (longer) 16 E ATA-100	Vide U 2-port dernal -bit LV contro	mirroring (mem Iltra160 SCSI (L SCSI backplan .8mm VHDCI 6 /D cable include oller in South Br p to 15K rpm S	VD 160 e for int 8-pin ce ed for a idge / o	OMB/sec) / onnector (1 ttaching an one-dro	dual c vap d 6-bit l optio p IDE	channel lisks (1 LVD ca nal Se cable	/ 64-b 6-bit L ble fro rveRA to bac	oit 66MHz VD cable om I/O Bo ID adapte ckplane fo	to So ard to er to t or dis	CSI backpla b ext connect the two-bay kette and C	ne) / ctor) / backp D-RO	olane M
Mechanical	EIA 19" rack	models (4	<b>U</b> 4) x 2	28" deep / supp	orted in	NetBAY™	Rack	s (sucl	n as N	etBAY42	SR, I	NetBAY42 E	ER)	
Chipset  Slots (Active™ PCI-X  RXE Expansion Port	IBM Memory In provides three VIA® 82C686E PCI 2.2 Bus F Six hot-swap F hot replace, h	O Controlle peer PCI b South Brid supports S PCI-X 1.0 sl not upgrad	er with ouses a dge (IE CSI, e lots <sup>10</sup> a <b>le, ho</b> f	<b>t expansion</b> ∕s∈	ports ( support BB, Sup Bus A, ower an eparate	each to a IE ts graphics, er I/O PC97 B, C, D sup d attention ed by insula	M PC adap 317V port ndica tive p	CI-X Hooter slot /UL [ke PCI-X stor light blastic o	est Brid with I yboar slots / ots (op divide	dge) / ead Remote S d, mouse designed otical sens rs	h IBN uper ]) / to th ors c	M PCI-X Hos visor Adapto e PCI-X 1.0 ontrol powe	st Brid er, speci er to slo	ge fication ot) /
CD-ROM / diskette Ethernet Graphics controller Ports	Broadcom® 57 SVGA / S3® Sa Rear: RXE-10	700 10/100. avage4 Pro 0 Expansio	/1000 o / on I on Port	MB diskette drivethernet control /O Board / 8MB (to connect opt , ethernet / no se	oller / or SDRAI ional R	n I/O Board M 125MHz : XE-100), RX	/ full o std/m <e ma<="" td=""><td>duplex ax / up anager</td><td>/ 64-b to 12 nent F</td><td>oit 66MHz 80x1024 a Port, two U</td><td>PCI at 64I ISB (</td><td>bus / Wake K colors at 8</td><td>on LA 35Hz</td><td>N®</td></e>	duplex ax / up anager	/ 64-b to 12 nent F	oit 66MHz 80x1024 a Port, two U	PCI at 64I ISB (	bus / Wake K colors at 8	on LA 35Hz	N®
Security	Power-on and	administra	tor pas	sswords / unatte	nded b	oot/selecta	ble b	oot						
Systems mgmt Diagnostics Software	console and m Light Path Dia IBM Real Time available ever	ngmt / powe agnostics e Diagnosti n while serv	er on/o ™ / pri ics (op rer run	PCI adapter / in ff system / moni mary indicator of perated through ning .PC® UPS softw	itors po on infor IBM Di	wer status, mation pan rector)	op sy el wit BM F 1-8	rstem, t h LEDs Preload 8 Proce	empe s asso Kit fo essors	rature, dis ociated with r Microsof	ks, fail th fail t Win	ans, powers ling compor idows 2000	supplionents / Datac 4	es center, 8161BU
Keyboard / mouse Power supplies	None standard Std: two; max. watts at 110v front access / fans in each p	d (because : two / hot-s / redundan worldwide ower suppl o, redundar	rack-l swap / t at 22 / volta ly / PF	pased) ' 1050 watts at 2 '0v with two pov ge-sensing / au 'A	220v or ver sup ito-rest	550 plies / art /	xSerio 512M 1GB I Xeon Xeon Xeon	es SMF IB PC1 PC133 MP 1.9 MP 1.9 MP 2.0	P Expa 33 EC ECC 5GHz/ 9GHz/	ansion Mo CC SDRAM SDRAM F 1MB L3 C 1MB L3 C 2MB L3 C	dule MRD RDIM Cache Cache Cache	IMM M Proc Upg Proc Upg Proc Upg	5 3 5 5 5	9P5188 3L3324 1P8300 9P5171 9P5172 9P5173
- IBM Datacenter S - Prerequisite: Prelo Six available 3.3 volt	oad Kit for MIcr	osoft® Wir	h pow d with ndows	© <b>2000 Datace</b> ⇒ Dimensions	nter Of : H7.0"	ferings x W19.0" x	BM T Other D27.	7540 15 roption .5"	5" Flat s at <b>ib</b>	Panel Co	lor M	Hot-Swap onitor (blac accessories	k) 9	6P5756 511AG4
Slot 1: fullsize, 64-bit Slot 2: fullsize, 64-bit Slot 3: fullsize, 64-bit	66MHz PCI-X,	, hot-swap E	Bus A	Dimensions  ⇒ Max weight:  ⇒ Stealth blace	: H178 : 110 lbs	mm x W483			mm	<i>₽</i> 1		IITED WAF		TY <sup>3</sup>



Std Std or opt Power Supply Supply Opt disk • Opt disk •

**4U Rack** 

□ Tool-free serviceability

Access processors, memory, adapters, and SMP Expansion Module 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
 Information LED panel and front-accessible pull-out Light Path panel (1st and 2nd level diagnostics without removing cover)

Predictive Failure Analysis® alerts on processors, XceL4 Server Accelerator Cache, memory, fans, power supplies, and optional disks with IBM Director

All models: Maximum internal disk capacity:

 → 1 year parts and labor
 → International Warranty Service<sup>3</sup>
 → On site, 24 hr x 7 day coverage, 

upgrade option (in eligible locations):<sup>7</sup>

• 24 hr x 7 day coverage, 2 hour response time (No ServicePac available)

Post warranty maintenance services available

≈ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period3

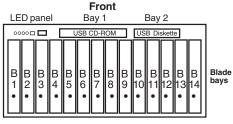
146.8GB with two 73.4GB2 hot-swap SCSI disks

Solution >
 ✓ US models announced June 2002, withdrawn effective March 25, 2003.

IBM <sup>®</sup> Type-model Qty∶	Processor c	L3 L4 ache cache	Memory	Disk	SCSI controller	Mech- anical	Slots SN x bays Mo		Hot-swap pwr supplies a	Mgmt Availab
8687-18X 8 x Xeo	n™ MP 1.4GHz 5	12KB 64MB 0	GB Chipkill™	None	2xUltra160	4U⁴ rack	6x4	Two	Two redundant	PCI Jan 200
8687-28X 8 x Xeo 8687-38X 8 x Xeo			GB Chipkill GB Chipkill	None None	2xUltra160 2xUltra160				Two redundant Two redundant	PCI Jan 200 PCI Jan 20
8687-48X 8 x Xec 88687-58X 8 x Xec	n MP 1.5GHz 1	MB 64MB 0	GB Chipkill	None	2xUltra160	4U rack	6x4	Two ⁻	Two redundant	PCI Feb 20
₹8687-78X 8 x Xec	n MP 2.0GHz 2	MB 64MB 0	GB Chipkill GB Chipkill	None	2xUltra160 2xUltra160	4U rack	6x4 <sup>-</sup>	Two T	Two redundant	PCI Feb 20
<ul> <li>Models certified for 16-v</li> <li>Processors</li> </ul>	8 x Intel® Xeon									
L2 cache	256KB or 512K	<b>(B</b> each proces	ssor / on die	of proce	essor / at pro	cessor s		20113 11	yper-rineading	teermology
L3 cache L4 cache	512KB or 1MB 6 64MB XceL4™ \$						Module) /	,		
Processor upgrade	ECC / 64-bit 400 <b>16-way SMP</b> wit			,	Controller					
SMP Expansion	Two SMP Expa	nion Modules:	<b>std</b> / two max	/ each c						
Module	L4 cache, sixtee Ports) / each SM									
Memory	0GB std / 32GE									
	slots (16 slots in PC133-complian	n each SMP Ex nt / 3.3v registe	pansion Moc ered 168-pin	lule) / m SDRAM	ust install for RDIMMs / 1	ur indenti 133MHz /	cal DIMM ' <b>Active I</b>	ls at sa <b>Vemor</b>	ame time / 4-wa v™ with <b>Error</b> (	y interleavino Checking an
	Correcting (EC	C), Chipkill™,	Memory Pro	oteXion⊺	<sup>™</sup> (1, 2, 3, o	r 4-bit err	rors on sa	ame ch	nip; up to two c	hips at once;
SCSI disk controller	redundant bit st								-	on I/O Board
SCSI implementatio	n First channel to	internal 2-port S	SCSI backplai	ne for int	ernal hot-swa	ap disks (1	16-bit LVD	cable)	to SCSI backpla	ne) /
	second channel one standard (lo									
IDE controller Disk - capacity/bays	Enhanced IDE A No disks standa									
Mechanical	EIA 19" rack me	· · · · ·				. ,			•	
Chipset	IBM XA-32™ ch	. ,				•				
•	IBM Memory I/O provides three po	Controller with	two remote I/0	O ports (	each to a IBM	1 PCI-X H	ost Bridge	e) / eac	h IBM PCI-X Ho	st Bridge
	VIA® 82C686B S	South Bridge (ID	E ATA-100, U	ISB, Sup	er I/O PC973	17VUL [k	eyboard, r	mouse]	)/	•
Slots (Active™ PCI-	PCI 2.2 Bus F su () Six hot-swap PC									
RXE Expansion Por	hot replace, ho							) Remo	ite Exnansion I	nclosure
CD-ROM / diskette	24X-10X <sup>6</sup> CD-R	· · ·								
Ethernet Graphics controller	Broadcom® 5700 SVGA / S3® Sav	0 10/100/1000 6	ethernet contr	oller / or	n I/O Board / 1	full duplex	∢ / 64-bit 6	66MHz	PCI bus / Wake	on LAN®
Ports	Rear: RXE-100 E	Expansion Port	(to connect op	tional R	XE-100), RXE	∃ Manage	ment Port	t, two U	SB (Vers 1.1), k	
Coourity	mouse, analog D				· ·		ne USB (V	/ers 1.1	1)	
Security Systems mgmt	Power-on and ac	<u> </u>					1 and seri	ial conr	nectors / provide	s remote
	console and mgr	mt / power on/of	f system / moı	nitors po	wer status, o	system,	temperati	ure, dis	ks, fans, power:	supplies
Diagnostics Software	Light Path Diag APC® UPS softw		nary indicator	on intori					n railing compor acenter 1-16 Pr	
Keyboard/mouse	None standard (			000,00	IBM	Software	Update S	Subscri	otion for Datace	nter 4816ADX
Power supplies	Std: two; max: tw watts at 110v / re	edundant at 220	Ov with two po	wer sup	plies /   1GB	MB PC13 PC133 E	ECC SDR	BAM RE	RDIMM DIMM	33L3324 31P8300
	front access / wo fans in each pov			uto-resta					SI Hot-Swap SI Hot-Swap	06P5755 06P5756
Coolingfans	Four hot-swap, rone additional fa	redundant, multi	i-speed fans /		IBM	ServeRA	ID™-4Mx	Ultra1	60 SCSI Adapt	er 06P5736
Cables	Three copper so	calability cables	s (one 10", tv	vo 2.5M	) / 8 to	16-Way ( 16-way (	Configurat	ion Kit'	*	73P8734 73P8735
Prerequisites	crossover ether IBM Preload Kit		Vindows 200	0 Datac					bay 2000 c/us/accessorie	22P9101 s
	1-16 Processor		A Dimension				ig existing	g x440	systems only	
Six available 3.3 vo Slot 1: fullsize, 64-b		ot-ewan Rue A		ıs: H178	mm x W483n		9mm			D ANTV3
Slot 2: fullsize, 64-b	it66MHz PCI-X, h	ot-swap Bus A	<ul><li>Max weigh</li><li>Stealth bla</li></ul>		s; 50kg			a 1 v	LIMITED WAF ear parts and la	
Slot 3: fullsize, 64-b Slot 4: fullsize, 64-b	it 100MHz PCI-X, h	ot-swap, bus b	<ul><li>⇒ Tool-frees</li><li>⇒ Access pro</li></ul>	erviceab		ontoro or	ad	Interpretation     Inte	ernational Warra	anty Service <sup>3</sup>
Slot 5: fullsize, 64-b Slot 6: fullsize, 64-b	it133MHz PCI-X, h	ot-swap, Bus C	SMP Expa	nsion Mo	dule from tor	o '			site, 24 hr x 7 d ne day respons	
Slot: used by Rem		20 Pit 201/11 I-	<ul><li>Access po</li><li>Setup Prog</li></ul>	wer supp g <u>ram</u> by i	olies and disk pressing F1 a	s from fro It startup	nt	□ 1 y	ear on site warr grade option (in	anty service
014 014 01	]		<ul> <li>Diagnostic</li> <li>SCSISelect</li> </ul>	s (PC-D	octor) by pres	ssing F2 a	t startup	loc	ations):7	_
Std Std or op Power Power Supply Supply	ή	4U Rack	Information	n LĚĎ pa	nel and front-	accessibl		2	4 hr x 7 day cov hour response	time
Opt disk • Opt disk	-				canel (1st and removing co		ei		No ServicePac av <b>st warranty mai</b> i	
diskette CD-F			<u>-</u>		-	•		ser	vices available (7 <sup>14</sup> toll-free sup	
Bay ① 3.5", 0.5",	access, diskette (		<b>N</b>					wa	rranty issues di	
Bay ② 3.5", 0.5", Bay ③ 3.5", SL 1",		) `	,	s: Maxir	num internal	disk cana	acity:	wa	rranty period <sup>3</sup>	
Bay @ 3.5", SL 1",					73.4GB <sup>2</sup> hot-					
See footnotes for in								(Y///C	D16) © IBM Corr	Docombor

IDM®					0001		01.1.	OMPE		Marine A collection
IBM® Type-model Qty x	Processor cac		Memory	Disk	SCSI controller	Mech- anical		SMP Exp Modules	Hot-swap pwr supplies	Mgmt Available adapter date
8687-1VX 8 x Xeon			4GB Chipkill™			4U <sup>4</sup> rack			Two redundant	PCI Jan 2003
8687-2VX 8 x Xeor 8687-3VX 8 x Xeor	n MP 1.6GHz 1ME	8 64MB	4GB Chipkill 4GB Chipkill	None None	2xUltra160 2xUltra160	4U rack	6x4	Two	Two redundant Two redundant	t PCI Jan 2003
☞ 8687-4VX 8 x Xeor ☞ 8687-5VX 8 x Xeor			4GB Chipkill 4GB Chipkill	None None	2xUltra160 2xUltra160				Two redundant Two redundant	t PCI Feb 2003 t PCI Feb 2003
	n MP 2.0GHz 2ME	3 64MB 4	4GB Chipkill	None	2xUltra160	4U rack	6x4			PCI Feb 2003
Processors	way with VMware™ ESX S 8 x Intel® Xeon™	_						upports H	Hyper-Threading	a technology
L2 cache L3 cache	256KB or 512KB	each proces	ssor / on die	of proce	essor / at pro	cessor s			,	3
L4 cache	Up to <b>2MB</b> each p <b>64MB XceL4™ Se</b>	rver Accelei	rator Cache (	32MB in	each SMP E		Modul	e)/		
Processor upgrade	ECC / 64-bit 400M 16-way with mate				Controller					
SMP Expansion	Two SMP Expanie	on Modules	std / two max	<pre></pre>						
Module	L4 cache, sixteen Ports) / each SMF									
Memory	4GB std / 32GB n	nax <sup>13</sup> per cha	assis (up to <b>1</b>	<b>6GB</b> in	each SMP E	xpansion	Modu	e) / eigh	t 512MB DIMM	ls installed /
•	32 DIMM gold-con 4-way interleaving	nector slots	(16 slots in ea	ch SMP	Expansion M	lodule) / I	must in	stall four	indentical DIMN	As at same time /
	Error Checking a	and Correct	ing (ECC), C	hipkill™	4. Memory P	roteXior	า™ (1,	2, 3, or 4	4-bit errors on	same chip; up to
0001 11 1 11	two chips at once									
SCSI disk controller SCSI implementation	Adaptec® AIC-789 First channel to int									
•	second channel to one standard (long									
IDE controller	Enhanced IDE AT	Á-100 contro	ller in South E	Bridge / c	ne one-drop	IDE cabl	e to bad	kplanė fo	or diskette and	ĆD-RÓM
Disk - capacity/bays	No disks standard		•						<del>'</del>	
Mechanical	EIA 19" rack mod	. ,	<u> </u>	•		•				
Chipset	IBM XA-32™ chips IBM Memory I/O C									
	provides three pee VIA® 82C686B Sou									iter,
0	PCI 2.2 Bus F supp	oorts SČSI, e	thernet / PCI-	X Bus A,	B, C, D supp	ort PCI-X	( slots /	designed	$\vec{l}$ to the PCI-X 1.	
Slots (Active™ PCI-X	Six hot-swap PCI-) hot replace, hot u								sors control pow	er to slot) /
RXE Expansion Port	One port to supp	ort up to 12	additional Po	CI-X slot	s viå an opti	onal IBN	I RXE-1	100 Rem	ote Expansion	Enclosure
CD-ROM / diskette Ethernet	24X-10X <sup>6</sup> CD-RON Broadcom® 5700 1									
Graphics controller	SVGA / S3® Savag	e4 Pro / on I/	O Board / 8M	B SDRA	M 125MHz st	d/max / u	p to 12	30x1024	at 64K colors at	85Hz
Ports	Rear: RXE-100 Ex mouse, analog DB									keyboard,
Security	Power-on and adm	inistrator pas	swords/unat	tended b	oot/selectab	le boot			-	
Systems mgmt	Remote Supervis									
Diagnostics	console and mgmt Light Path Diagno	/ power on/o pstics™ / prir	mary indicato	r on infor	mation panel	with LED	, tempe Os asso	ciated wi	sks, fans, powe th failing compo	n supplies onents /
Software	None								processor licens	
Keyboard / mouse Power supplies	None standard (be Std: two; max: two			t 220v or				SDRAM I DRAM R		33L3324 31P8300
	watts at 110v / red front access / work	undant at 22	Ov with two po	ower sup	plies / IBM	36.4GB	10K U	tra160 S0	CSI Hot-Swap	06P5755
	fans in each powe	r supply / PF.	Ā		IBM	73.4GB <sup>-</sup>	10K Ultı	a160 SC	CSI Hot-Swap SI Hot-Swap	06P5768 06P5756
Coolingfans	Four hot-swap, recone additional fan							Mx Ultra <sup>.</sup> ıration Ki	160 SCSI Adar t*	oter 06P5736 73P8734
Cables	Three copper sca	lability cable			) / 8 to	16-way (	Configu	ration Kit	*	73P8735
Prerequisites	crossover etherne VMware ESX Ser	ver 1.5 (16		ense), m					abay 2000 oc/us/accessori	22P9101 es
	keyboard, mouse,	SCSI disk,				. •	ng exis	ting x440	systems only	
Six available 3.3 volt Slot 1: fullsize, 64-bit		ewan Rue A			' x W19.0" x D mm x W483n		9mm		LIMITEDWA	DD ANTV3
Slot 2: fullsize, 64-bit	66MHz PCI-X, hot-	swap Bus A	<ul><li>Max weigh</li><li>Stealth bla</li></ul>	nt: 110 lb				<b>a</b> 1	LIMITED WA	
Slot 3: fullsize, 64-bit Slot 4: fullsize, 64-bit			□ Tool-free s	serviceat				□ Ir	nternational Wa	rranty Service <sup>3</sup>
Slot 5: fullsize, 64-bit Slot 6: fullsize, 64-bit	133MHz PCI-X, hot-	swap, Bus C			s, memory, ad odule from tor		nd		on site, 24 hr x 7 ame day respo	7 day coverage, nse time <sup>7</sup>
Slot: used by Remo			Access po	wer supp	olies and disk	s from fro	ont	≈ 1	year on site wa	arranty service
• •			Diagnostic	s (PC-D	pressing F1 a octor) by pres	sing F2 a	at startu	p lo	cations):7	
Std Std or opt Power Power		U Rack			ssing Ctrl+A a anel and front-		le		24 hr x 7 day c 2 hour respons	se time
Supply Supply  Opt disk • Opt disk	<u> </u>		pull-out Lig	ght Path	panel (1st and t removing co	2nd leve			(No ServicePac ost warranty m	
Opt disk • Opt disk •			VMware E	SX Serv	er supports W	/indows N		S	ervices availab	le
	access, diskette (UI		Server, Re		ver, Windows nux 7.1 or 7.2				4x7 <sup>14</sup> toll-free s arranty issues	
Bay ② 3.5", 0.5", Bay ③ 3.5", SL 1",	access, CD-ROM (l access. hot-swap	Jltrabay 2000	0)					W	arranty period	
Bay @ 3.5", SL 1",					mum internal 73.4GB² hot-			s		
	aartant warranty info		1			•			DESVI @ IBM Co	

	_								
	pported b	Blade Swi Days modulo I / max std /	bays modu		Management nodule bays std / max	Power module bays std / max	Blower module bays std / max	Mech- anical	Available date
8677-1XX 8678 HS	20, SCSI Exp 0	/14 0/	4 Ethernet,	Fibre Channe	1/1	2/4	2/2	7U⁴ rack	Nov 2002
Positioning Description	Flexible, innovati Provides common and expansion, e. for USB, keyboar	n resources s external Fibre	nared by blade s Channel storage	ervers such a	s power, syste	eṁ manageme	nt, cabling, eth		
Blade bays	Supports 8678 H			Storage Expa	insion Units)	/ 14 hot-plugga	able bays / fror	nt access	
Switch modules Ethernet Switch Module Fibre Channel Switch Module	Std: none; max: f Supports two 4-p support on HS20 bays 1 and 2 wire Supports two 2-p two ports on optic bays 3 and 4 wire	oort GB Ether blade server ed to the HS2 port Fibre Cha onal Fibre Ch	net Switch Modu (two modules to 0 dual integrate nnel Switch Mo annel Expansio	o support both d ethernet cor <i>dules</i> in bays n Card (two m	ethernet con strollers / four 3 and 4 / one odules to sup	ntrollers on HS rexternal ports Fibre Channe oport both ports	20 and for failo / connects to I Switch Modul s and for failov	ver redund std mgmt r e required er redunda	dancy) / nodule for one of ancy) /
Management modules	Std: one; max: or communicates w connectivity / por connection port	rith integrated rts: DB-15 and	system manago alog video port,	ement process PS/2 keyboar	sor on each F d port, PS/2	IS20 server bla	ade / multiplex	or for cons	ole
Powermodules	Std: two in bays of hot-swap / rear a power to all modu bays 3 and 4 (rec	ccess / 1200 ules and blad	watts at 220v / l e bays 1 througl	ooth redundar n 6 / power for	t to each oth bays 7 throu	er (N+N redun gh 14 requires	dancy) / two st two additiona	d modules I power mo	s supply odules in
Blowermodules	Std: two; max: tw	o / hot-swap	/ redundant / va	riable speed /	rear access	/ 325 cubic ft p	er min (CFM)	front to be	ack airflow
Mechanical CD / diskette / USB	EIA 19" rack mo 24X-10X° CD-RO front access / sha button on server b	OM / 3.5" 1.44 ared by up to blade front pa	MB diskette driv I 4 blade servers nel	e / one USB pe s / requests for	ort (Version 1 CD-ROM, di	.1) / all USB in skette drive, ar	terface / not read USB port by	movable / pressing (	
Keyboard/mouse Ports	None standard / p server blade front Rear: keyboard ( Front: one USB (	t panel / supp (PS/2), mouse	orts NetBAÝ AC	T CAT5 chain	ing solutions				
Security	Login password for recommended in								
Ethernet Systems mgmt	One of the dual in Ethernet Switch M Provides remote disks, blowers, po	<i>Module</i> (the se console and n	econd HS20 ethengmt / power on/	ernet controlle off blades/mo	r requires a se dules / monito	econd optional ors power statu	4-port GB Ethe s, operating sy	ernet Switc	h Module)
System LED panel	System LED pan							ditions	
NetBAY 1U Flat Pane NetBAY 2U Flat Pane NetBAY ACT Local C NetBAY ACT Remote NetBAY ACT 250mm NetBAY ACT 1.5m K IBM Sleek 2-Button S NetBAY42 Enterprise NetBAY42 Standard NetBAY42 Standard APC Smart-UPS 500	el Monitor Console console Manager (te e Console Manage I KVM Conversion VM Conversion Opteath Black Mous e Rack Cabinet Rack Cabinet Rack Cabinet	e Kit (with kýbo CAT5 KVM ca er (CAT5 KVM Option ption	l/monitor) 32P1 ıbling) 1735l	702 IBM BI .04 IBM BI R16 IBM BI 636 IBM FA 652 IBM FA 673 IBM GE 12S IBM EE 120 IBM TE 120 OBM TE 120 OBM TE 120 OBM TE	adeCenter 4- adeCenter 2- adeCenter Ac AStT700 Fibre AStT200 Store 78 (16.0" vis) 54 (13.8" view 541 15" Flat Fr options at <b>ib</b>	Supply Module port GB Ethern port Fibre Char coustic Attenua e Channel Stora age Server CRT flat shade vable) FST Mor enel Color Mo m.com/pc/us/a from IBM Blad	et Switch Modinnel Switch Modinnel Switch Module (fo age Server ow mask Monit nitor (black) initor (black) accessories	ule dule or rear) or (blk)	48P7052 48P7054 48P7062 49P2694 17421RU 35421RU 66274AN 633147N 9512AB1



#### Rear

SM SM PM 3 1 3 •	Blower module 1 • (std)	PM 1	M M 1	Modu
SM   SM   PM   4   •	Blower module 2 • (std)	PM 2	Reserved	bays
Switch Power modules modules	r	Power I		ı gement dule

- 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
- ays 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

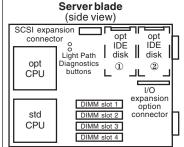
ule	Switch module bay	Switch module function
•	1	Ethernet link 1 for all blade servers
	2	Ethernet link 2 for all blade servers
	3	Network connection 1 for all blade server I/O expansion options (Fibre Channel)
nt	4	Network connection 2 for all blade server I/O expansion options (Fibre Channel)

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

- 3 year parts and labor
- International Warranty Service³
   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 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)
   Cthor ServicePac entires et
- Other ServicePac options at ibm.com/services/its/us/ source/wamomxeu.pdf
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

(both std)

											• • • • • • • • • • • • • • • • • • • •	
IBM® Type-model Qty x Pro		•	Disk			option	al stor	ort with exp unit			Required chassis	Available date
8678-21X 1 x Xeon 8678-41X 1 x Xeon				open) EIDE open) EIDE				Ultra320 Ultra320		6U <sup>4</sup> blade 6U blade	BladeCenter BladeCenter	
☞ 8678-51X 1 x Xeon	2.67GHz 512M	IB 400Mhz	None (	open) EIDE	2 fixed	2 hot	-swap	Ultra320	0x2	6U blade	BladeCenter	Mar 2003
8678-61X 1 x Xeon Positioning	<u>2.8GHz 512M</u> Ultra-dense, hi			open) EIDE				Ultra320		6U blade	BladeCenter	Mar 2003
Processor(s)	1 x Intel® Xeo	n 2.0 to 2.8GI	<b>Hz</b> with 4	00 MHz fron	tside bus	s / Hyp	er-Th			gy / NetBu	urst™ microarch	nitecture
L2 cache SMP support	<b>512KB</b> / on die <b>2-way SMP</b> / up											
Implementation	Server blade co	ontains two Inte	el 604-pir	n micro-PGA 2	ZIF sock	ets, fοι	ur men					
	one SCSI expa		-		•		r, and	integrated	d graph	ics and du	al ethernet	
Memory	512MB std / 80 PC2100 266MH						our DIN	MM gold-c	onnec	tor slots on	systemboard /	DIMMs
	must be installed	ed in matched	pairs [a b	ank] / 2-way r	nemory i	interlea	ave / d	ual čhann	el / me	mory bus r	uns at 2 x 100M	1Hz/
	detects 2- throu					ım Chi	ркііі™	(corrects	1, 2, 3	, or 4-bit er	rors on same ch	nip and
IDE controller						wo cor	nnecto	ors on plai	nar / ea	ach suppor	ts one 2.5" IDE	disk/
IDE diek bevo	no cable as IDI	E disk attache:	s to riser	card and tray	ı (include	ed with	option	n kit) / ead	h IDE	connector	on separate bu	IS
IDE disk bays SCSI disk controller	Supports max None / suppor											S20 via
	one connector											
	CIOB-X2 I/O B one-inch high §	SL SCSI disks	in front b	ays / one 16-	bit interr	nal cha	innel /	no cables	or ext	ernal conn	ij with two not-s iector)	swap 3.5
SCSI disk bays	Supports max 6 80-pin SCA-2 0	of two hot-swa	.p 3.5" SL	. Ultra320 SC	SI disks	in opti	ional S	SCSI Stor	age Ex	pansion U	nit /	
External storage	Support for IBN						AS fam	nily of prod	ducts)			
Mechanical											NetBAY™ Rack	k products
Architecture / chipsets	ServerWorks one CIOB-X2 I											ernet and
, , , , , , , , , , , , , , , , , , , ,	the I/O expans	ion option con	nector/C	CSB5 South É	Bridge (T	hin IM	B to H	lost Bridge	e) for E	IDE, USB	, LPC bus to	
Bus slots	Super I/O, and No PCI or PCI-									17 Super i	/O cnip	
Ethernet controllers	Two gigabit 10/	/100/1000 ethe	rnet cont	rollers / Broad	dcom® B	CM570	 03 / on	blade / tw	o PCI-	X 64-bit 10	00MHz buses / f	ull duplex /
	Wake on LAN®	/ Alert Standar	rd Format	t 1.0 / teaming	g and fail	over su	upport	/one of th	ne dual	controllers	connects to an	
Network-interface	4-port GB Ethe One connecto										e modules in ba	ys
								hé same e	expans	ion card (o	r no expansion	card) /
CD / diskette / USB	ethernet and s None / requests	s for CD-ROM,	diskette	drive, and US	BB port ir	n Blade	Cente	r by press	ing CE	select but	ton on front cor	ntrol panel
Kybd / video / mouse Graphics	None / requests SVGA / ATI® R									utton on fro	nt control panel	ı '
Systems mgmt										.2 Cache F	Proc I Ing	48P7060
Systems mgmi	IBM integrated H8S2148 / on b	olade / provide	s system	and environr	mental	X	Ceon 2	2.4GHz/51	2KB L	.2 Cache F	Proc Upg	48P7096
	monitoring, ever for communica									L2 Cache 2 Cache F		73P5982 73P5983
Diagnostics	Light Path Dia	ignostics™ (L	ED lights	indicate failir	ng	5	12MB	PC2100 (	CL2.5 E	ECC DDR-9	SDRAM DIMM	33L5038
	component) an	id on-board dia	agnostics	(via PC-Doc	tor in BI						RAM RDIMM RAM RDIMM	33L5039 33L5040
Security	Power-on pass unattended boo				t mode		BM H	S20 SCSI	Storg	e Expansi	on Unit (blade)	48P7058
Software ship group	Documentation					)   "					ion Card (with t Switch Module)	
Coolingfans	Uses cooling fr					,,,	вім на	S20 40ĠE	3 <sup>2</sup> 5400	rpm ATA-		48P7063 06P5768
Power supply	on each proces Uses power mo				ront pan	~   з	36.4GE	3 15K Ultra	320 S	CSI Hot-Sv	vap SL HDD*	06P5776
Prerequisites	Monitor, keybo	ard, mouse for	setup; e	thernet switc	h module					CSI Hot-Sv orage Expa	vap SL HDD*	06P5756
	disk, BladeCer	iter (type 8677	), operati	ng system			ו אכום	- cyun es 31	001010			#2
										LIMITE	D WARRANT	۲°



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
- 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 146.8GB\* with two 73.4GB SL SCSI disks

#### LIMITED WARRANTY

- 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 ibm.com/services/its/us/ source/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.
- <sup>7</sup> These services are available for machines normally used for business, professional, or trade purposes, rather than personal. family or household purposes. Not all machine 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>13</sup> 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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- Asset ID allows your computer to be scanned by various radio frequency emitting devices which must be purchased separately from independent companies.
- <sup>17</sup> 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.



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