



xSeries Reference (xREF)

including

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

April 4, 2006

xref@us.ibm.com



IBM® Machine Type	Model	Processor	Speed/Core	L2 Cache	FSB MHz	Memory	Disk	Disk controller	Maximum Capacity	Slots x bays	Hard disk bays	Ethernet	Available date
8486 - E1x		Celeron® D 326	2.53GHz	256KB	533	256MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Sep 2005
8486 - E2x		Celeron D 326	2.53GHz	256KB	533	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Sep 2005
8486 - E3x		Pentium® 4 521	2.8GHz/SC	1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Sep 2005
8486 - E4x		Pentium 4 531	3.0GHz/SC	1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Sep 2005
8486 - E5x		Pentium 4 541	3.2GHz/SC	1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Sep 2005
8486 - E6x		Pentium 4 551	3.4GHz/SC	1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Sep 2005
8486 - E7x		Pentium D 820	2.8GHz/DC	2x1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Oct 2005

Positioning Processor(s) *Uniprocessor, entry server designed to meet small business needs and budgets*
Intel® Pentium 4 up to 3.4GHz Single Core 800MHz FSB / Pentium D 2.8GHz Dual Core 800MHz FSB / Intel Celeron D 2.53GHz 533MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **1MB** std on Pentium 4 / **2x1MB** std on Pentium D / **256KB** std and max on Celeron / ECC / full speed
 Implementation Motherboard contains one LGA-775 socket, four DIMM sockets, four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI), integrated SATA and Gigabit Ethernet.
 SMP support No SMP support / no processor upgrade

Memory **256MB or 512MB** / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / All Error Checking and Correcting (ECC) / DIMMs and ECC memory controller / industry std / unbuffered /

SCSI disk controller None standard / Ultra320 SCSI controller2 (LVD 320MB/sec) optional for tape backup
 IDE disk controller Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
 SATA disk controller Dual channel SATA controller (1.5GB/sec) / supports 2 drives standard
 Cables One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk
 Disk 80GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
 RAID Controller None standard / ServeRAID 7t controller optional

Rack support None
 Bus slots (see below) One PCI E bus / one 64-bit PCI-E x8 slot / one 64-bit PCI-E x1 / two 32-bit 33MHz 5v PCI 2.2 slots
 Chipset **Intel E7230 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-7) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / **SMSC® LPC47M192** Super I/O for diskette, parallel, serial, keyboard, mouse

Ethernet 10/100/1000 gigabit / Broadcom 5721 / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®

CD-ROM / diskette Ports *Some: CD-ROM: 48X-20X⁶ CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X⁶ / None standard*
Front: two USB (Ver 2.0); Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)

Diagnostics Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
 Systems mgmt None

Graphics controller AT® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024 x 768 x 32 bit @85Hz

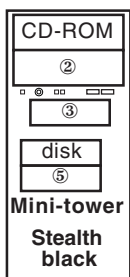
Security Optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse/display

Software **ServerGuide™** (CD-based automated network OS installation and configuration tool) included and IBM Director (system hardware mgmt software) optional

512MB PC2-4200 CL3 ECC DDR2 RoHS	30R5148
2x1GB PC2-4200 CL3 ECC DDR2 RoHS	30R5149
2x2GB PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA-150 (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA-150 (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA-150 (7.2K) simple-swap HDD	39M4508
48X/32X/48X/16X Max ⁶ CD-RW/DVD (black)	32R2905
IBM Multi-burner Plus	32R2906
IBM USB Portable Diskette Drive	05K9276
36/72GB DDS/5 Internal Tape Drive	71P9145
VXA-2 Tape Drive	59P6746
IBM 20/40GB TR7 Internal Tape Drive	48P7042
IBM ServeRAID-7t SATA Controller	71P8648
IBM Ultra320 SCSI Controller2	13N2249

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

Keyboard / mouse IBM 101 key keyboard / IBM mouse (both black)
 Cooling fans Three variable speed fans (cpu heatsink, rear, power supply) / not redundant / not hot-swap
 Power supply 310 watts / universal / manual switching / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)



Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open (no disk)
 Bay ③ 3.5", SL 1", access, open
 Bay ④ 3.5", SL 1", access, std disk
 Bay ⑤ 3.5", SL 1", access, open

Slot 1: fullsize, 64-bit PCI-E x8 (4GBps)
 Slot 2: fullsize, 64-bit PCI-E x1 (500MBps)
 Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
 Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)

- ✦ 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

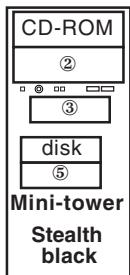
- ✦ H 16.8" x W 8" x D 19.4"
- ✦ H 427mm x W 203mm x D 493mm
- ✦ 36 to 45.8 pounds (16.3 to 20.8kg)
- ✦ BTU Output:
 Minimum: 379 Btu/hr (111 watts)
 Maximum: 853 Btu/hr (250 watts)

LIMITED WARRANTY³
 ⇨ 1 year parts and labor
 ⇨ International Warranty Service³
 ⇨ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
 ⇨ On site service upgrade options (in eligible locations):⁷
 • 3 year IOR 24x7, 2 hr avg response (ServicePac part num 41W9318)
 • 3 year IOR 24x7, 4 hr avg response (ServicePac part num 41W9317)
 • 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41W9316)
 • 3 year IOR 9x5, NBD response (ServicePac part num 41W9315)
 ⇨ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
 ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

See footnotes for important warranty information

IBM® Machine Type	Model	Processor	Speed/Core	L2 Cache	FSB MHz	Memory	Disk	Disk controller	Maximum Capacity	Slots x bays	Hard disk bays	Ethernet	Available date
8486 - EAx		Celeron® D 331	2.66GHz	256KB	533	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EBx		Celeron D 331	2.66GHz	256KB	533	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - ECx		Pentium® 4 521	2.8GHz/SC	1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EDx		Pentium 4 631	3.0GHz/SC	2MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EEx		Pentium 4 631	3.0GHz/SC	2MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EFx		Pentium 4 641	3.2GHz/SC	2MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EGx		Pentium D 920	2.8GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EHx		Pentium D 920	2.8GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EJx		Pentium D 930	3.0GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EKx		Pentium D 930	3.0GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Mar 2006

Positioning Processor(s)	<i>Uniprocessor, entry server designed to meet small business needs and budgets</i>												
L2 cache Implementation	Intel® Pentium 4 up to 3.2GHz Single-Core 800MHz FSB / Pentium D up to 3.0GHz Dual-Core 800MHz FSB / Intel Celeron D 2.66GHz 533MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T) 1 or 2MB std on Pentium 4 / 4MB std on Pentium D / 256KB std and max on Celeron / ECC / full-speed												
SMP support	Motherboard contains one LGA-775 socket, four DIMM sockets, four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI), integrated SATA and Gigabit Ethernet.												
Memory	No SMP support / no processor upgrade												
SCSI disk controller	None standard / Ultra320 SCSI controller2 (LVD 320MB/sec) optional for tape backup												
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar												
SATA disk controller	Dual channel SATA controller (1.5GB/sec) / supports 2 drives standard												
Cables	One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk												
Disk	80GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.												
RAID Controller	None standard / ServeRAID 7t controller optional												
Rack support	None												
Bus slots (see below)	One PCI Express® bus / one 64-bit PCIe™ x8 slot / one 64-bit PCIe x1 / two 32-bit 33MHz 5v PCI 2.2 slots												
Chipset	Intel E7230 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-7) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse												
Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®												
CD-ROM / diskette Ports	<i>Some: CD-ROM: 48X-20X® CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X® / None standard</i> <i>Front: two USB (Ver 2.0); Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)</i>												
Diagnostics Systems mgmt	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD None												
Graphics controller	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024 x 768 x 32 bit @85Hz												
Security	Optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse/display												
Software	ServerGuide™ (CD-based automated network OS installation and configuration tool) included and IBM Director (system hardware mgmt software) optional					512MB PC2-4200 CL3 ECC DDR2 RoHS 2x1GB PC2-4200 CL3 ECC DDR2 RoHS 2x2GB PC2-4200 CL3 ECC DDR2 RoHS IBM 80GB SATA-150 (7.2K) simple-swap HDD IBM 160GB SATA-150 (7.2K) simple-swap HDD IBM 250GB SATA-150 (7.2K) simple-swap HDD 48X/32X/48X/16X Max® CD-RW/DVD (black) IBM Multi-burner Plus IBM USB Portable Diskette Drive 36/72GB DDS/5 Internal Tape Drive VXA-2 Tape Drive IBM 20/40GB TR7 Internal Tape Drive IBM ServeRAID-7t SATA Controller IBM Ultra320 SCSI Controller2					30R5148 30R5149 30R5150 39M4500 39M4504 39M4508 32R2905 32R2906 05K9276 71P9145 59P6746 48P7042 71P8648 13N2249		
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black)												
Cooling fans	Three variable speed fans (cpu heatsink, rear, power supply) / not redundant / not hot-swap												
Power supply	310 watts / universal / manual switching / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)												



Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open (no disk)
 Bay ③ 3.5", SL 1", access, open
 Bay ④ 3.5", SL 1", access, std disk
 Bay ⑤ 3.5", SL 1", access, open

Slot 1: fullsize, 64-bit PCI-E x8 (4GBps)
 Slot 2: fullsize, 64-bit PCI-E x1 (500MBps)
 Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
 Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)

- ❖ 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
- ❖ H 16.8" x W 8" x D 19.4"
- ❖ H 427mm x W 203mm x D 493mm
- ❖ 36 to 45.8 pounds (16.3 to 20.8kg)
- ❖ BTU Output:
Minimum: 379 Btu/hr (111 watts)
Maximum: 853 Btu/hr (250 watts)

LIMITED WARRANTY³

- ⇨ 1 year parts and labor
- ⇨ International Warranty Service³
- ⇨ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇨ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 41W9318)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 41W9317)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41W9316)
 - 3 year IOR 9x5, NBD response (ServicePac part num 41W9315)
- ⇨ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

For GAV systems, lowercase "y" should be replaced with a country-specific code.

IBM® Machine Type	GAV-model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Power Supply	Ethernet	Available date
8485/8490	10y-10x	Pentium® 4 531 3.0GHz	1MB	800	512MB	80GB/SATA	1.0TB	4 x 7	4 fixed	1x400W	Gigabit	Oct 2005
8485/8490	12y-12x	Pentium 4 531 3.0GHz	1MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	1Ay-1Ax	Pentium 4 630 3.0GHz	2MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	20y-20x	Pentium 4 640 3.0GHz	2MB	800	512MB	80GB/SATA	1.0TB	4 x 7	4 fixed	1x400W	Gigabit	Oct 2005
8485/8490	2Ay-2Ax	Pentium 4 640 3.2GHz	2MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	3Ay-3Ax	Pentium 4 650 3.2GHz	2MB	800	2x512MB	None/SAS/SATA	1.2TB	4 x 7	4 hot-swap	1x400W	Gigabit	Oct 2005
8485/8490	3By-3Bx	Pentium 4 650 3.2GHz	2MB	800	1GB	None/SAS/SATA	1.2TB	4 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	70y-70x	Pentium D 820 2.8GHz	2x1MB	800	512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	7Ay-7Ax	Pentium D 820 2.8GHz	2x1MB	800	1GB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	80y-80x	Pentium D 830 3.0GHz	2x1MB	800	512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	8Ay-8Ax	Pentium D 830 3.0GHz	2x1MB	800	1GB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Oct 2005

Positioning Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*
Intel® Pentium 4 up to 3.4GHz Single Core 800MHz FSB / Pentium D up to 3.0GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **Up to 2MB** std on Pentium 4 / **2x1MB** std on Pentium D
 Implementation Motherboard contains one LGA-775 socket, four DIMM sockets, some: four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI) some: six slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI, 2 PCI-X), integrated SATA and Gigabit Ethernet.
 SMP support No SMP support / no processor upgrade

Memory **512MB or 1GB** std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-4200 533MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

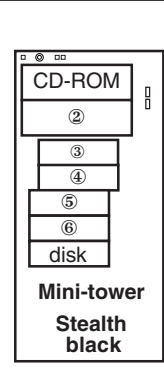
SAS disk controller Integrated SAS controller / supports SAS or SATA drives
 IDE disk controller Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
 SATA disk controller Four channel SATA controller (3.0GB/sec) / supports 4 drives standard
 Cables One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk
 Disk Some: 80GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
 RAID Controller IBM ServerRAID™ 8e (RAID 0, 1) / on planar / supports SATA or SAS interface

Rack support 5U⁴ rack mount support via tower-to-rack kit option
 Bus slots (see below) All: one PCI-E bus / one 64-bit PCI-E x8 / one 64-bit PCI-E x1 / two 32-bit 33MHz 5v PCI 2.2 slots / some: two 64-bit 66MHz 3.3v PCI-X slots / no hot-swap Active™ PCI slots
 Chipset **Intel E7230 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse

Ethernet 10/100/1000 gigabit / Broadcom 5721 / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
 CD-ROM / diskette Ports **CD-ROM:** 48X-20X⁶ CD-ROM, IDE / None standard
Front: two USB (2.0); *Back:* two serial (9-pin), parallel, two USB (2.0), keyboard, mouse, ethernet (RJ45) and monitor
 Diagnostics Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
 Systems mgmt Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan speed and failure, and voltages / **secure remote power on/off / support for optional Remote Supervisor Adapter II**

Graphics controller ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Security Mechanical side panel key lock / U-Bolt Tie-down capability/ power-on password / boot sequence control / operation without keyboard/mouse
 Software **ServerGuide™** (CD-based automated network OS installation and configuration tool), **ServerRAID™** (RAID management), IBM Director (system hardware management software) and many utilities
 Keyboard / mouse Optional
 Cooling fans Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap
 Power supply Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed)
 512MB PC2-4200 CL3 ECC DDR2RoHS
 2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS
 4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS
 IBM 80GB SATA (7.2K) simple-swap HDD
 IBM 160GB SATA (7.2K) simple-swap HDD
 IBM 250GB SATA (7.2K) simple-swap HDD
 80GB Hot-Swap SATA HDD
 160GB Hot-Swap SATA HDD
 250GB Hot-Swap SATA HDD
 73GB 10K 3.5" SAS Hot-Swap HDD
 146GB 10K 3.5" SAS Hot-Swap HDD
 300GB 10K 3.5" SAS Hot-Swap HDD
 36GB 15K 3.5" SAS Hot-Swap HDD
 73GB 15K 3.5" SAS Hot-Swap HDD
 48X/32X/48X/16X Max® CD-RW/DVD-ROM Combo (black)
 IBM Remote Supervisor Adapter II (PCI adapter)
 IBM 5Ux20D Tower-to-Rack Kit
 IBM ServerRAID-7i SATA Integrated Controller
 Other options at ibm.com/pc/us/accessories
 30R5148
 30R5149
 30R5150
 39M4500
 39M4504
 39M4508
 39M4518
 39M4522
 39M4526
 26K5709
 26K5710
 26K5711
 26K5697
 26K5698
 32R2905
 59P2984
 39R9361
 71P8648



- All:
 Slot 1: fullsize, 64-bit PCI-E x8 (4GBps)
 Slot 2: fullsize, 64-bit PCI-E x1 (500MBps)
 Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
 Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
 Some:
 Slot 5: fullsize, 64-bit 66MHz, PCI-X (3.3v)
 Slot 6: fullsize, 64-bit 66MHz, PCI-X (3.3v)
 Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open (no disk)
 Bay ③ 3.5", SL 1", access, open
 Bay ④ 3.5", SL 1", access, open
 Bay ⑤ 3.5", SL 1", access, open
 Bay ⑥ 3.5", SL 1", access, open
 Bay ⑦ 3.5", SL 1", access, std disk (some)
 Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure
 Redundant power supplies standard in some models

- ◆ 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
 - ◆ H 17.25" x W 8.5" x D 21.25"
 - ◆ H 448mm x W 215.9mm x D 539.75mm
 - ◆ 36 to 45.8 pounds (16.3 to 20.8kg)
- Maximum SATA capacity:
 1TB¹³ (4 disks x 250GB)
 Maximum hot-swap SAS capacity:
 1.2TB¹³ (4 disks x 300GB)

LIMITED WARRANTY³

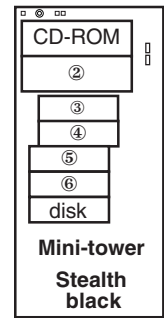
- 1 year parts and labor standard 8485 MTM
- 3 year parts and labor standard 8490 MTM
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9512)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9511)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9510)
 - 3 year IOR 9x5, NBD response (ServicePac part num 69P9509)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM @server™ xSeries™ 206m

xREF by eServer Field Skills and Education Team

For GAV systems, lowercase "y" should be replaced with a country-specific code.

IBM® Machine Type	GAV-model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum PCI slots Capacity	x bays	Hard disk bays	Power Supply	Ethernet	Available date	
8485/8490	A2y-A2x	Pentium® 4 521	2.8GHz ¹	1MB	800	512MB	None/SATA	1.0TB	4 x 7	4	simple-swap	1x400W Gigabit	Feb 2006
8485/8490	B2y-B2x	Pentium 4 631	3.0GHz	2MB	800	512MB	None/SATA	1.0TB	4 x 7	4	simple-swap	1x400W Gigabit	Feb 2006
8485/8490	G2y-G2x	Pentium D 920	2.8GHz	4MB	800	512MB	None/SATA	1.0TB	4 x 7	4	simple-swap	1x400W Gigabit	Feb 2006
8485/8490	H2y-H2x	Pentium D 930	3.0GHz	4MB	800	512MB	None/SAS/SATA	1.0TB	4 x 7	4	hot-swap	1x400W Gigabit	Feb 2006
8485/8490	J2y-J2x	Pentium D 940	3.2GHz	4MB	800	2x512MB	None/SAS/SATA	1.0TB	4 x 7	4	hot-swap	1x400W Gigabit	Feb 2006
8485/8490	J4y-J4x	Pentium D 940	3.2GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	4 x 7	4	hot-swap	1x400W Gigabit	Feb 2006
Positioning	Single socket, entry server for small and medium size business' and distributed enterprises												
Processor(s)	Intel® Pentium 4 up to 3.0GHz Single-Core 800MHz FSB / Pentium D up to 3.2GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)												
L2 cache Implementation	1 or 2MB std on Pentium 4 / 4MB std on Pentium D												
SMP support	Motherboard contains one LGA-775 socket, four DIMM sockets, some: four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI) some: six slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI, 2 PCI-X), integrated SATA and Gigabit Ethernet.												
Memory	512MB or 1GB std / 8GB ¹³ max / four 184-pin gold-plated DIMM sockets / one or two socket used / PC2-4200 533MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC) / DIMMs and ECC memory controller / industry std / unbuffered												
SAS disk controller	Integrated SAS controller / supports SAS or SATA drives												
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar												
SATA disk controller	Four channel SATA controller (3.0GB/sec) / supports 4 drives standard												
Cables	One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk												
Disk	Some: 80GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.												
RAID Controller	IBM ServeRAID™ 8e (RAID 0, 1) / on planar / supports SATA or SAS interface												
Rack support	5U ⁴ rack mount support via tower-to-rack kit option												
Bus slots (see below)	All: one PCI Express® bus / one 64-bit PCIe™ x8 / one 64-bit PCIe x1/ two 32-bit 33MHz 5v PCI 2.2 slots / some: two 64-bit 66MHz 3.3v PCI-X slots / no hot-swap Active™ PCI slots												
Chipset	Intel E7230 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse												
Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®												
CD-ROM / diskette	CD-ROM: 48X-20X ⁶ CD-ROM, IDE / None standard												
Ports	Front: two USB (2.0); Back: two serial (9-pin), parallel, two USB (2.0), keyboard, mouse, ethernet (RJ45) and monitor												
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD												
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan speed and failure, and voltages / secure remote power on/off / support for optional Remote Supervisor Adapter II												
Graphics controller	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz												
Security	Mechanical side panel key lock / U-Bolt Tie-down capability/ power-on password / boot sequence control / operation without keyboard/mouse												
Software	ServerGuide™ (CD-based automated network OS installation and configuration tool), ServeRAID™ (RAID management), IBM Director (system hardware management software) and many utilities												
Keyboard / mouse	Optional												
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap												
Power supply	Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed)												



All:
 Slot 1: fullsize, 64-bit PCI-E x8 (4GBps)
 Slot 2: fullsize, 64-bit PCI-E x1 (500MBps)
 Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
 Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
Some:
 Slot 5: fullsize, 64-bit 66MHz, PCI-X (3.3v)
 Slot 6: fullsize, 64-bit 66MHz, PCI-X (3.3v)

Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open (no disk)
 Bay ③ 3.5", SL 1", access, open
 Bay ④ 3.5", SL 1", access, std disk (some)
 Bay ⑤ 3.5", SL 1", access, open
 Bay ⑥ 3.5", SL 1", access, open
 Bay ⑦ 3.5", SL 1", access, open

➤ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure
 ➤ Redundant power supplies standard in some models

- 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
- H 17.25" x W 8.5" x D 21.25"
- H 448mm x W 215.9mm x D 539.75mm
- 36 to 45.8 pounds (16.3 to 20.8kg)

Maximum SATA capacity:
1TB¹³ (4 disks x 250GB)
 Maximum hot-swap SAS capacity:
1.2TB¹³ (4 disks x 300GB)

LIMITED WARRANTY³

- 1 year parts and labor standard 8485 MTM
- 3 year parts and labor standard 8490 MTM
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9512)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9511)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9510)
 - 3 year IOR 9x5, NBD response (ServicePac part num 69P9509)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

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IBM® Type-model	Processor	GHz ¹	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date	
8649-42X	1 x Xeon™	2.67	512KB	533	512MB	36.4GB ²	Ultra320 10K	Ultra320	None (4 fixed)	6 x 7	One fixed	Gigabit	Feb 2004
8649-4AX	1 x Xeon	2.67	512KB	533	512MB	None (open-bay)	Ultra320	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Feb 2004
8649-4BX	1 x Xeon	2.67	512KB	533	512MB	None (open-bay)	Ultra320	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Feb 2004
8649-52X	1 x Xeon	2.8B	512KB	533	512MB	36.4GB	Ultra320 10K	Ultra320	None (4 fixed)	6 x 7	One fixed	Gigabit	Feb 2004
8649-5AX	1 x Xeon	2.8B	512KB	533	512MB	None (open-bay)	Ultra320	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Feb 2004
8649-5BX	1 x Xeon	2.8B	512KB	533	512MB	None (open-bay)	Ultra320	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Feb 2004
8649-62X	1 x Xeon	3.06	512KB	533	512MB	36.4GB	Ultra320 10K	Ultra320	None (4 fixed)	6 x 7	One fixed	Gigabit	Feb 2004
8649-6AX	1 x Xeon	3.06	512KB	533	512MB	None (open-bay)	Ultra320	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Feb 2004
8649-6BX	1 x Xeon	3.06	512KB	533	512MB	None (open-bay)	Ultra320	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Feb 2004

Processor(s) **1 x Intel® Xeon up to 3.06 GHz with 533MHz frontside bus (FSB) / Hyper-Threading technology**
 SMP - L2 Cache **2-way SMP / up to two Xeon Processors (same speed/cache size) / 512KB std and max / at processor speed**
 Implementation **Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, seven slots (one PCI 2.2, four PCI-X, one Mini PCI [used by graphics], one unavailable AGP), and integrated SCSI and ethernet**

Memory **512MB std / 8GB¹³ max / two slots used / two slots available / PC2100 266MHz CL2.5 registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 512MB and greater DIMMs**

IDE disk controller **Enhanced IDE busmaster / ATA-100 / integrated in I/O Controller Hub 4 / two connectors on planar**
 SCSI disk controller **LSI Logic® 53C1030 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-1 mirroring (Embedded Mirroring) / shared with optional IBM ServeRAID™-5i Controller for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed only in Slot 4) Two 16-bit channels (one internal and one external) / Internal channel: Fixed disk models: one 4-drop 16-bit 68-pin LVD SCSI cable from systemboard to internal disks bays; Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; External channel: cable available as option pn 24P7929 from systemboard to rear external 68-pin connector**

SCSI channels and cables **One SCSI cable (listed above), one 2-drop EIDE cable (to CD-ROM)**
 Cables **Some: 36.4GB Ultra320 SCSI / 10K rpm / 4.7 ms average read seek / S.M.A.R.T.⁵**

Rack support **4U⁴ rack mount support via tower-to-rack kit option**
 Bus slots (see below) **Four 64-bit 100MHz PCI-X 1.0 / one PCI 2.2 / one Mini PCI / one AGP 8X (not available) / no hot-swap Active™ PCI slots**
 Chipset **Intel E7505 chipset / E7505 MCH (Memory Controller Hub) for AGP 8X slot, P64H2, ICH4 / P64H2 for two PCI-X buses (Bus A for slots 2 and 3 and ethernet controller; Bus B for slots 4 and 5 and SCSI controller) / I/O Controller Hub (ICH4) for PCI 2.2 bus (one slot and one Mini PCI slot), ATA-100 EIDE, USB, Low Pin Count Interface / NS PC87366 Super I/O off LPC interface**

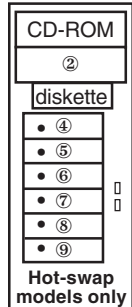
Ethernet **One gigabit 10/100/1000 ethernet controller / Broadcom BCM5703i / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 1.0 / one rear RJ-45 port**
 CD-ROM / diskette **CD-ROM: 48X-20X⁶ CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive**
 Ports **Front: two USB (Ver 2.0); Back: two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15), microphone-in (mono), line-in (stereo), line-out (stereo)**
 Diagnostics **Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD**
 Systems mgmt cntrl **Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / support for optional Remote Supervisor Adapter II (provides continuous health monitoring and control)**

Graphics controller **SVGA / ATI® RageXL / on Mini PCI adapter / 8MB SDRAM std and max / PCI 2.2 32-bit 33MHz / analog 15-pin D-Sub conn**

Security **Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)**
 Software **ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities**
 Keyboard / mouse **IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)**
 Cooling fans **up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)**
 Power supply(s) **All: not redundant / not hot-swap / all variable speed**
Some: one 425 watt std and max / not hot-swap
xBX: two 514 watt std and max / hot-swap / redundant
All: universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)

Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)	Xeon 2.67 GHz/533/512KB L2 Cache Proc Upg Xeon 2.80 GHz/533/512KB L2 Cache Proc Upg Xeon 3.06 GHz/533/512KB L2 Cache Proc Upg 2x256MB PC2100 CL2.5 ECC non-Chipkill DIMM Kit 512MB PC2100 CL2.5 ECC DDR-SDRAM	24P7861 24P8054 24P8122 73P2868 33L5038
Software	ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities	1GB PC2100 CL2.5 ECC DDR-SDRAM DIMM 2GB PC2100 CL2.5 ECC DDR-SDRAM DIMM IBM 73.4GB 10K Ultra320 SCSI 68-pin (not hot-swp) IBM 146GB 10K Ultra320 SCSI 68-pin (not hot-swp) IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD 40X/12X/40X Max ⁶ CD-RW internal (black) IBM Remote Supervisor Adapter II (PCI adapter) IBM 4U Extended Depth Tower-to-Rack Kit IBM ServeRAID-5i Controller (adapter for Slot 4) IBM ServeRAID-6i Controller (adapter for Slot 4)	33L5039 33L5040 32P0724 32P0725 06P5776 32P0727 32P0728 22P6976 59P2984 59P4817 25P3492 71P8595

Slot 1: half-length, 32-bit 33MHz, PCI 2.2 (5v)
 Slot 2: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)
 Slot 3: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)
 Slot 4: fullsize, 64-bit 100MHz, PCI-X 1.0* (3.3v) extended*
 Slot 5: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)
 Slot 6: Mini PCI type III, 32-bit 33MHz (5v) - used graphics
 Slot: fullsize, AGP 8X Pro50 (1.5v) - unavailable
 * Extended slot for opt IBM ServeRAID-5i



Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open
 Bay ③ 3.5", SL 1", access, diskette
Hot-swap models 6AX and 6BX:
 Six bays ④ to ⑨ 3.5", SL 1", access, hot-swp
Fixed disk models 62X:
 Bay ④ 3.5", SL 1", no access, not hot-swap
 Bay ⑤ 3.5", SL 1", no access, not hot-swap
 Bay ⑥ 3.5", SL 1", no access, not hot-swap
 Bay ⑦ 3.5", SL 1", no access, not hot-swap
Maximum internal SCSI disk capacity¹³:
 Fixed: 587.2GB (4 disks x 146.8GB)
 Hot-swap: 880.8GB (6 disks x 146.8GB)

- ◆ Raven black color
- ◆ Removable left side panel
- ◆ Configuration/Setup Utility invoked by pressing F1 at startup
- ◆ BIOS Setup Utility via F1 at startup
- ◆ LSI Configuration Utility near startup by pressing CTRL+C
- ◆ DMI 2.2-compliant
- ◆ Adv Config Power Interface (ACPI) 1.0a
- ◆ Device Driver and IBM Enhanced Diagnostics CD-ROM included
- ◆ Four stabilizing feet
- ◆ Handle grip on top
- ◆ H 18.4" x W 6.5" x D 26.0"
- ◆ H 467mm x W 165mm x D 660mm
- ◆ 44 to 57 pounds (20 to 25.8kg)
- ◆ Fixed disk models: metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- ◆ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY³

- ⇒ 1 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD response (ServicePac® part num 96P2248)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 96P2249)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2250)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2251)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
 US models announced January 20, 2004
 • = Hot-swap bays in some models

IBM® Type-GAV-model	Processor	L2 GHz¹ cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-40Y-40x	1 x Xeon™	3.0	2MB	800	512MB	80GB² SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit Mar 2005
8648-44Y-44x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Mar 2005
8648-4By-4Bx	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Mar 2005
8648-50Y-50x	1 x Xeon	3.2	2MB	800	512MB	80GB SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit Mar 2005
8648-5AY-5Ax	1 x Xeon	3.2	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Mar 2005
8648-5BY-5Bx	1 x Xeon	3.2	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Mar 2005
8648-60Y-60x	1 x Xeon	3.4	2MB	800	512MB	80GB SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit Mar 2005
8648-6AY-6Ax	1 x Xeon	3.4	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Mar 2005
8648-6BY-6Bx	1 x Xeon	3.4	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Mar 2005

Processor(s) **1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB) / EM64T / 2MB L2 ECC Cache / Hyper-Threading technology**
 SMP - L2 Cache Implementation **2-way SMP / up to two Xeon Processors (same speed/cache size) / 2MB** std and max / at processor speed
 Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)

Memory **512MB** std / 16GB¹³ max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-conductor slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater

SATA disk controller Dual Channel SATA-150 controller (150MB/sec / two connectors on planar / supports ServerRAID™ 7e
 SCSI disk controller **Adaptec® 7902 / dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector

Cables One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),
 RAID Controller IBM ServeRAID 7e (RAID 0 Or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller

Mechanical 4U⁴ Tower (rack mount support via tower-to-rack kit option)
 Bus slots (see below) One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots
 Chipset **Intel E7525 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface

Ethernet One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port
 CD-ROM / diskette **CD-ROM:** 48X-20X* CD-ROM, IDE / **Diskette:** 3.5" 1.44MB diskette drive
 Ports *Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)

Diagnostics Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
 Systems mgmt cntrl Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)
 Graphics controller SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector

Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)	Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg 512MB (2x256) PC2-3200 ECC DDR2 1GB (2x512) PC2-3200 ECC DDR2 1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit 2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit IBM 80GB SATA-150 (7.2K) simple-swap HDD IBM 160GB SATA-150 (7.2K) simple-swap HDD IBM 250GB SATA-150 (7.2K) simple-swap HDD IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD 40X/12X/40X Max ⁶ CD-RW internal (black) IBM Remote Supervisor Adapter II (PCI adapter) IBM 4U Extended Depth Tower-to-Rack Kit IBM ServeRAID-6i+ controller (adapter for Slot 5) IBM ServeRAID 7t SATA controller	25R8900 25R8901 13N0676 73P3523 73P3522 73P2865 73P2866 73P8002 73P8003 73P8006 06P5776 32P0727 32P0728 22P6976 59P2984 26K6095 13N2190 71P8648
Software	ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities		
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)		
Cooling fans	Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) All: not redundant / not hot-swap / all variable speed Some: one 530 watt std and max / not hot-swap xBx: two 514 watt std and max / hot-swap / redundant All: universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)		



Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open
 Bay ③ 3.5", SL 1", access, diskette
 Hot-swap models:
 Six bays ④ to ⑨ 3.5", SL 1", access, hot-swap
 Simple-swap models: 2 std, 2 avail(up to 4 SATA HDDs maybe added with ServeRAID 7t controller)
 Bay ④ 3.5", SL 1", simple-swap
 Bay ⑤ 3.5", SL 1", simple-swap
 Bay ⑥ 3.5", SL 1", simple-swap
 Bay ⑦ 3.5", SL 1", fixed

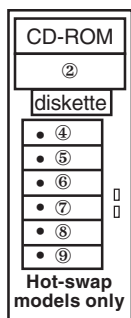
Maximum internal disk capacity¹³:
 SATA: 500GB (2 disks x 250GB); 1TB (4 disks x 250GB) w/ ServeRAID 7t
 SCSI: 880.8GB (6 disks x 146.8GB)

LIMITED WARRANTY³

- ↪ 1 year parts and labor
- ↪ International Warranty Service³
- ↪ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ↪ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD response (ServicePac® part num 96P2248)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 96P2249)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2250)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2251)
- ↪ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-GAV-model	Processor	L2 GHz¹ cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-32U-32x	1 x Xeon™	2.8	2MB	800	512MB	80GB² SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit Sep 2005
8648-34U-34x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Sep 2005
8648-36U-36x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Sep 2005
8648-E3U-E3x	1 x Xeon	2.8	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Sep 2005
8648-E5U-E5x	1 x Xeon	2.8	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Sep 2005
8648-E7U-E7x	1 x Xeon	3.2	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Sep 2005
8648-B2U-B2x	1 x Xeon	3.0	2MB	800	512MB	80GB SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit Apr 2006
8648-B4U-B4x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Apr 2006
8648-B6U-B6x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Apr 2006
Processor(s) SMP - L2 Cache Implementation	1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB) / EM64T / 2MB L2 ECC Cache / Hyper-Threading technology / 2-way SMP / up to two Xeon Processors (same speed/cache size) / 2MB std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)										
Memory	512MB std / 16GB¹³ max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / PC2-3200 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-conductor slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater										
SATA disk controller SCSI disk controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar / supports ServerRAID™ 7e Adaptec® 7902 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports RAID-0 & 1 mirroring / Two 16-bit channels (one internal and one external) / Internal channel: Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; External channel: cable available as option pn 24P7929 from systemboard to rear external 68-pin connector										
Cables RAID Controller	One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM), IBM ServeRAID 7e (RAID 0 Or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller										
Mechanical Bus slots (see below) Chipset	4U⁴ Tower (rack mount support via tower-to-rack kit option) One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots Intel E7525 chipset / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface										
Ethernet CD-ROM / diskette Ports	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port CD-ROM: 48X-20X⁵ CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive Front: two USB (Ver 2.0); Back: two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)										
Diagnostics Systems mgmt cntrl	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / support for optional Remote Supervisor Adapter II (provides continuous health monitoring and control)										
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector										
Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)										
Software	ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities										
Keyboard / mouse Cooling fans	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2) Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) All: not redundant / not hot-swap / all variable speed Some: one 530 watt std and max / not hot-swap Some: two 514 watt std and max / hot-swap / redundant All: universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)										
Power supply(s)	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2) Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) All: not redundant / not hot-swap / all variable speed Some: one 530 watt std and max / not hot-swap Some: two 514 watt std and max / hot-swap / redundant All: universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)										

- Slot 1: fullsize, PCI-Express x16 (3.3v)*
- Slot 2: fullsize, 32-bit/33MHz, PCI (5v)
- Slot 3: fullsize, 32-bit/33MHz, PCI (5v)
- Slot 4: fullsize, 64-bit 133MHz, PCI-X 1.0 (3.3v)
- Slot 5: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)**
- Slot 6: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)
- * support only for x8 adaptors
- ** slot for opt IBM ServeRAID-6i+



- Bay ① 5.25", HH 1.6", access, CD-ROM
- Bay ② 5.25", HH 1.6", access, open
- Bay ③ 3.5", SL 1", access, diskette

- Hot-swap models:
Six bays ④ to ⑥ 3.5", SL 1", access, hot-swp
- Simple-swap models: 2 std, 2 avail (up to 4 SATA HDDs maybe added with ServeRAID 7i controller)
- Bay ④ 3.5", SL 1", simple-swap
- Bay ⑤ 3.5", SL 1", simple-swap
- Bay ⑥ 3.5", SL 1", simple-swap
- Bay ⑦ 3.5", SL 1", fixed

Maximum internal disk capacity¹³:
SATA: 500GB (2 disks x 250GB); 1TB (4 disks x 250GB) w/ ServeRAID 7i
SCSI: 880.8GB (6 disks x 146.8GB)

Xeon 2.8 GHz/800/2MB L2 Cache EM64TProc Upg	40K2500
Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg	40K2515
Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg	40K2516
Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg	40K2517
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	39M5818
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	39M5821
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	39M5809
IBM 80GB SATA-150 (7.2K) simple-swap HDD	40K6864
IBM 160GB SATA-150 (7.2K) simple-swap HDD	40K6868
IBM 250GB SATA-150 (7.2K) simple-swap HDD	40K6872
IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	30R5096
IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1023
IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1024
48X/32X/48X Max⁶ CD-RW internal (black)	22P7042
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 4U Extended Depth Tower-to-Rack Kit	26K6095
IBM ServeRAID-6i+ controller (adapter for Slot 5)	13N2190
IBM ServeRAID 7i SATA controller	71P8648

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

LIMITED WARRANTY³

- ⇒ 1 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD response (ServicePac® part num 96P2248)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 96P2249)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2250)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2251)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
• = Hot-swap bays in some models

IBM® Type-GAV-model	Processor	L2 GHz¹ cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8488-32U-32x	1 x Xeon™	2.8	2MB	800	512MB	80GB² SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit Sep 2005
8488-34U-34x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Sep 2005
8488-36U-36x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Sep 2005
8448-B2U-B2x	1 x Xeon	3.0	2MB	800	512MB	80GB SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit Apr 2006
8448-B4U-B4x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Apr 2006
8448-B6U-B6x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Apr 2006

Processor(s) **1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB) / EM64T / 2MB L2 ECC Cache / Hyper-Threading technology**
 SMP - L2 Cache **2-way SMP / up to two Xeon Processors (same speed/cache size) / 2MB std and max / at processor speed**
 Implementation **Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)**

Memory **512MB std / 16GB¹³ max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / PC2-3200 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater**

SATA disk controller **Dual Channel SATA-150 controller (150MB/sec / two connectors on planar / supports ServeRAID™ 7e**
 SCSI disk controller **Adaptec® 7902 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports RAID-0 & 1 mirroring / Two 16-bit channels (one internal and one external) / Internal channel: Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; External channel: cable available as option pn 24P7929 from systemboard to rear external 68-pin connector**

Cables **One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),**
 RAID Controller **IBM ServeRAID 7e (RAID 0 Or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller**

Mechanical **4U⁴ Tower (rack mount support via tower-to-rack kit option)**
 Bus slots (see below) **One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots**
 Chipset **Intel E7520 chipset / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface**

Ethernet **One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port**

CD-ROM / diskette **CD-ROM: 48X-20X⁶ CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive**
 Ports **Front: two USB (Ver 2.0); Back: two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)**

Diagnostics **Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD**
 Systems mgmt cntrl **Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / support for optional Remote Supervisor Adapter II (provides continuous health monitoring and control)**

Graphics controller **SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector**

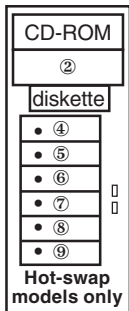
Security **Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)**

Software **ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities**

Xeon 2.8 GHz/800/2MB L2 Cache EM64TProc Upg	40K2500
Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg	40K2515
Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg	40K2516
Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg	40K2517
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	39M5818
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	39M5821
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	39M5809
IBM 80GB SATA-150 (7.2K) simple-swap HDD	40K6864
IBM 160GB SATA-150 (7.2K) simple-swap HDD	40K6868
IBM 250GB SATA-150 (7.2K) simple-swap HDD	40K6872
IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	30R5096
IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1023
IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1024
48X/32X/48X Max ⁶ CD-RW internal (black)	22P7042
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 4U Extended Depth Tower-to-Rack Kit	26K6095
IBM ServeRAID-6i+ controller (adapter for Slot 5)	13N2190
IBM ServeRAID 7i SATA controller	71P8648

- Slot 1: fullsize, PCI-Express x16 (3.3v)*
- Slot 2: fullsize, 32-bit/33MHz, PCI (5v)
- Slot 3: fullsize, 32-bit/33MHz, PCI (5v)
- Slot 4: fullsize, 64-bit 133MHz, PCI-X 1.0 (3.3v)
- Slot 5: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)**
- Slot 6: fullsize, 64-bit 100MHz, PCI-X 1.0 (3.3v)
- * support only for x8 adaptors
- ** slot for opt IBM ServeRAID-6i+

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



Bay ① 5.25", HH 1.6", access, CD-ROM
 Bay ② 5.25", HH 1.6", access, open
 Bay ③ 3.5", SL 1", access, diskette

Hot-swap models:
 Six bays ④ to ⑨ 3.5", SL 1", access, hot-sw

Simple-swap models: 2 std, 2 avail (up to 4 SATA HDDs maybe added with ServeRAID 7i controller)

Bay ④ 3.5", SL 1", simple-swap
 Bay ⑤ 3.5", SL 1", simple-swap
 Bay ⑥ 3.5", SL 1", simple-swap
 Bay ⑦ 3.5", SL 1", fixed

Maximum internal disk capacity¹³:
 SATA: 500GB (2 disks x 250GB); 1TB (4 disks x 250GB) w/ ServeRAID 7i
 SCSI: 880.8GB (6 disks x 146.8GB)

- ◇ Raven black color
- ◇ Removable left side panel
- ◇ Configuration/Setup Utility invoked by pressing F1 at startup
- ◇ BIOS Setup Utility via F1 at startup
- ◇ Adaptec Configuration Utility near startup by pressing CTRL+I
- ◇ DMI 2.2-compliant
- ◇ Adv Config Power Interface (ACPI) 1.0a
- ◇ Device Driver and IBM Enhanced Diagnostics CD-ROM included
- ◇ Four stabilizing feet
- ◇ Handle grip on top
- ◇ H 18.4" x W 6.5" x D 25.9"
- ◇ H 467mm x W 165mm x D 658mm
- ◇ 44 to 57 pounds (20 to 25.8kg)
- ◇ Fixed disk models: metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- ◇ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY³

- ⇒ 1 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD response (ServicePac® part num 96P2248)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 96P2249)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2250)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2251)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
 • = Hot-swap bays in some models

IBM® Type-model	Qty x Processor	L2 cache	L3 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8671-K1X	1 x Xeon®	2.67GHz	512KB	0MB	512MB	None	2 x Ultra320 Tower	6x10 (6 hot-swap std; 9 max)	560W fixed	Gigabit	Jan 2004
8671-KAX	1 x Xeon	2.67GHz	512KB	0MB	512MB	None	2 x Ultra320 Tower	6x10 (6 hot-swap std; 9 max)	560W hot	Gigabit	Jan 2004
8671-L1X	1 x Xeon	2.8BGHz	512KB	0MB	512MB	None	2 x Ultra320 Tower	6x10 (6 hot-swap std; 9 max)	560W fixed	Gigabit	Jan 2004
8671-LAX	1 x Xeon	2.8BGHz	512KB	0MB	512MB	None	2 x Ultra320 Tower	6x10 (6 hot-swap std; 9 max)	560W hot	Gigabit	Jan 2004
8671-M1X	1 x Xeon	3.06GHz	512KB	0MB	512MB	None	2 x Ultra320 Tower	6x10 (6 hot-swap std; 9 max)	660W fixed	Gigabit	Jan 2004
8671-MAX	1 x Xeon	3.06GHz	512KB	0MB	512MB	None	2 x Ultra320 Tower	6x10 (6 hot-swap std; 9 max)	660W hot	Gigabit	Jan 2004

These models ship standard with **Non-Chipkill DIMMs**. Chipkill is **optionally available** with purchase of 512MB DIMMs or higher.

Positioning Processor(s)	<i>Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price</i>
L2 cache	Up to 1 x Intel® Xeon™ Processor 3.06 GHz with 533MHz frontside bus / Hyper-Threading technology
L3 cache	512KB / all models / on die of processor / at processor speed
SMP support	1MB / available on some models / on die of processor / at processor speed
Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, six memory gold-connector DIMM slots, six PCI slots (two hot-swap Active™ PCI slots), and integrated SCSI, ethernet, graphics

Memory	512MB std / 12GB max / two slots used / four slots available PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2x100MHz / Error Checking and Correcting (ECC) (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2-through 8-bit errors contained in two chips) / 16-bit Checksum Chipkill™ optionally available, requiring 512MB DIMMs
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SCSI disk controller	LSI Logic® 53C1030 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-1 mirroring with up to one hot-spare disk / shared with optional IBM ServeRAID™-6i Controller for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed only in Slot 4)
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SCSI channels	Two 16-bit channels / <i>SCSI Channel A:</i> 16-bit 68-pin LVD cable from controller to backplane; <i>Channel B:</i> 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 32P8164) or via opt ServeRAID adapter with external connector(s)
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IDE controller / cable	Enhanced IDE ATA-100 controller in CSB5 South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)
Disk - capacity	None standard / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks

Mechanical	Tower / conversion to or EIA 19" Rack (5U ⁴) via optional kit for support in IBM NetBAY™ Racks
Chipset	ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Bridge (memory controller and I/O Bridge) / two CIOB-X2 I/O Bridges (IMB2 bus to Host Bridge for PCI-X 1.0 Bus B with slots 2, 3, 4 and Ultra320 and ethernet controllers; IMB2 bus to Host Bridge for PCI-X 1.0 Bus C with slots 5 and 6) / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2 bus A with slot 1 and graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / NS PC87417 Super I/O

Ethernet controller	10/100/1000 gigabit / Broadcom® BCM 5703 / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format
CD-ROM / diskette	48X-20X ⁶ CD-ROM / IDE / 1.6" HH; <i>Diskette:</i> 3.5" 1.44MB diskette drive / dust cover
Rear ports	<i>Rear:</i> two USB (Vers 1.1), keyboard, mouse, parallel, two serial (9-pin), graphics (DB-15), ethernet (RJ-45), two RJ-45 (sys mgmt)
Front port / graphics	<i>Front:</i> one USB (Vers 1.1); <i>Graphics:</i> SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus

Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot
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Systems mgmt	IBM Integrated system management processor (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter with 20-pin connector on planar for continuous power (no ext pwr reqd)	Xeon 2.67GHz/512KB L2 Cache Proc Upg	71P8966
Diagnostics	Light Path Diagnostics™ panel providing LED map to failing part (under side cover) / Information LED Panel in front	Xeon 2.8BGHz/512KB L2 Cache Proc Upg	71P8967
		Xeon 3.06GHz/512KB L2 Cache Proc Upg	02R1988
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others	2x256MB PC2100 Non-Chipkill DDR-SDRAM Kit	73P2868
		512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038

Keyboard / mouse	IBM 101-key keyboard / IBM mouse (both black)	36.4GB 15K-2 80 Ultra320 SCSI Hot-Swap SL HDD	06P5776
Power supply	MAX: std/max: two/two 660 watt M1X: std/max: one/two 660 watt xAX: std/max: two/two 560 watt Rest: std/max: one/two 560 watt	All: voltage-sensing / auto-restart / fan in each	3-Pack Ultra320 Hot-Swap Expansion Kit IBM 560W Hot-Swap Power Upgrade Kit* IBM 660W Hot-Swap Power Upgrade Kit (3.06 Only) 02R2015
Fans	Four fans and two blowers / variable speed / hot-swap / redundant / PFA / fan in each power supply	Other options at ibm.com/pc/us/accessories *Not backward compatible with 400Mhz FSB x235	

Slot 1: full, 32-bit 33MHz 5v PCI 2.2, Bus A
Slot 2: full, 64-bit 100MHz 3.3v PCI-X, not hot, Bus B
Slot 3: full, 64-bit 100MHz 3.3v PCI-X, not hot, Bus B
Slot 4: full, 64-bit 100MHz 3.3v PCI-X, not hot, Bus B*
Slot 5: full, 64-bit 133MHz 3.3v PCI-X, hot-swap, Bus C
Slot 6: full, 64-bit 133MHz 3.3v PCI-X, hot-swap, Bus C
* Extended slot for opt IBM ServeRAID-5i Controller

Bay ①	3.5", SL 1", access, diskette
Bay ②	3.5", SL 1", access, hot-swap
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
Bay ⑥	3.5", SL 1", access, hot-swap
Bay ⑦	3.5", SL 1", access, hot-swap
Bay ⑧	5.25", HH 1.6" access, open**
Bay ⑨	5.25", HH 1.6" access, open**
Bay ⑩	5.25", HH 1.6" access, CD-ROM

Bays 2 through 7 support 6 SL disks via SCA-2 connectors.
**Bays 8 and 9 support three 3.5" disks via 3-Pack Kit 33P2751

- Quick release adapter slots (no screws)
 - Configuration/Setup Utility invoked by pressing F1 at startup
 - LSI Logic Configuration Utility near startup by pressing CTRL+C
 - Diagnostics (PC-Doctor™) by pressing F2 at startup
 - ACPI2.0-compliant
 - Operator Information Panel (in front)
 - 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
 - Tower: H 17.31" x W 8.5" x D 27.6"
 - 74 to 101 pounds
 - Stealth black color
- All models: Max int disk capacity:
1.321TB² with nine 146.8GB SL disks with 3-Pack Ultra160 Hot-Swap Expansion Kit

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 time⁷**
- **3 year on site warranty service upgrade options (in eligible locations):⁷**
 - **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)**
- **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

IBM® Type-model	Qty x Processor	L2 cache Memory	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8841-05U-05x	1 x Xeon® 2.8GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Sep 2005
8841-15y-15x	1 x Xeon 3.0GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-25y-25x	1 x Xeon 3.2GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-35y-35x	1 x Xeon 3.4GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-45y-45x	1 x Xeon 3.6GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-16y-16x	1 x Xeon 3.0GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-E1y-E1x	1 x Xeon 3.0GHz	2MB 1GB	3x73.4GB	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-55U-55x	1 x Xeon 3.8GHz	2MB 1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Sep 2005

Positioning	<i>Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price</i>								
Processor	Up to 1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6, 3.8 GHz with 800MHz frontside bus / Extended Memory 64 Technology (EM64T) / Simultaneous Multi-threading (SMT) / Hyper-Threading technology /								
L2 cache	2MB / all models / on die of processor / at processor speed								
SMP support	2-way SMP / up to two Xeon Processors (same speed/cache size)								
Implementation	Systemboard contains two Intel 604-pin micro-PGA XIF sockets, eight memory gold-connector DIMM slots, six PCI slots (one hot-swap Active™ PCI slots), and integrated SCSI, ethernet, graphics								
Memory	1GB std / 16GB max / two slots used / six slots available / PC2-3200 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2x200MHz / Error Checking and Correcting (ECC) (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / Active Memory™: memory mirroring, online-spare memory								
SCSI disk controller	Adaptec AIC 7902 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / HostRAID supports RAID-0, 1 mirroring (with up to one hot-spare disk / optional IBM ServeRAID™-7k Controller for low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10, 50 (installed on internal connector)								
SCSI channels	Two 16-bit channels / <i>SCSI Channel B</i> : 16-bit 68-pin LVD cable from controller to backplane; <i>Channel A</i> : 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 24P7973) or via opt ServeRAID adapter with external connector(s)								
IDE controller / cable	Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)								
Disk - capacity	None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled								
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks								
Mechanical	Tower / conversion to EIA 19" Rack (5U ⁴) via optional kit for support in IBM NetBAY™ Racks (13N0956)								
Slots	Two PCI-Express (one hot-plug), three PCI-X 64-bit (one 133MHz and two 100MHz), one 32-bit/33MHz slot								
Chipset (see below)	Intel E7520 chipset / Intel E7520 Memory Controller Hub (MCH): PXH, ICH5R, Dual Broadcom ethernet, two PCI-Express x8 slots (slots 2 & 3) / PXH: Bus A, two 64-bit/100MHz PCI-X slots (slots 4 & 5), Adaptec SCSI Bus B, one 64-bit/133MHz Hot-Plug slot (slot 6) / ICH5R: one 32-bit/33MHz slot (slot 1), ATI video, EIDE, USB, SMBus, LPC bus to Super I/O / NS PC87417 Super I/O								
Ethernet controller	Dual 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format (2.0) / IPMI (1.5)								
CD-ROM / diskette	48X-20X ⁶ CD-ROM / IDE / 1.6" HH; <i>Diskette</i> : 3.5" 1.44MB diskette drive / dust cover								
Rear ports	<i>Rear</i> : two USB (Vers 2.0), keyboard, mouse, parallel, two serial (9-pin), graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)								
Front port / graphics	<i>Front</i> : one USB (Vers 2.0); <i>Graphics</i> : SVGA / ATI® Radeon™ 7000M / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2								
Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot			Xeon 2.8GHz/2MB L2 Cache Proc Upg Xeon 3.0GHz/2MB L2 Cache Proc Upg Xeon 3.2GHz/2MB L2 Cache Proc Upg Xeon 3.4GHz/2MB L2 Cache Proc Upg Xeon 3.6GHz/2MB L2 Cache Proc Upg Xeon 3.8GHz/2MB L2 Cache Proc Upg				40K2503 40K2504 40K2505 40K2506 40K2507 40K2508	
Systems mgmt	IBM Integrated system management processor (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 20-pin connector on planar for continuous power (std on 32y) (no ext pwr reqd)								
Diagnostics	Light Path Diagnostics™ panel providing LED map to failing part (under side cover) / Information LED Panel in front								
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others								
Keyboard / mouse	IBM 101-key keyboard / IBM mouse (both black)								
Power supply	std/max: one/two 670 watt / voltage-sensing / auto-restart /								
Fans	Fan in each std/max: four/six/ two fans (front), two fans on planar, (Opt) two fans (rear) / variable speed / hot-swap / redundant with optional rear fans / PFA / fan in each power supply								

<p>Slot 1: half-length, 32-bit 33MHz 5v PCI 2.2, Bus A Slot 2: full, PCI-Express x4, Bus B Slot 3: full, PCI-Express x4, Bus C Slot 4: full, 64-bit 100MHz 3.3v PCI-X, Bus D Slot 5: full, 64-bit 100MHz 3.3v PCI-X, Bus D Slot 6: full, 64-bit 133MHz 3.3v PCI-X, hot-swap, Bus E</p> <p>Bay ① 3.5", SL 1", access, diskette Bay ② 3.5", SL 1", access, hot-swap 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 Bay ⑥ 3.5", SL 1", access, hot-swap Bay ⑦ 3.5", SL 1", access, hot-swap Bay ⑧ 5.25", HH 1.6" access, open** Bay ⑨ 5.25", HH 1.6" access, open** Bay ⑩ 5.25", HH 1.6" access, CD-ROM</p> <p>Bays 2 through 7 support 6 SL disks via SCA-2 connectors. **Bays 8 and 9 support three 3.5" disks via 3-Pack Kit 33P2751</p> <p>Tower</p>	<ul style="list-style-type: none"> ➤ Quick release adapter slots (no screws) ➤ Configuration/Setup Utility invoked by pressing F1 at startup ➤ Adaptec Configuration Utility near startup by pressing CTRL+I ➤ Diagnostics (PC-Doctor™) by pressing F2 at startup ➤ ACPI 2.0-compliant ➤ Operator Information Panel (in front) ➤ 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 ➤ Tower: H 17.31" x W 8.5" x D 27.6" ➤ 74 to 101 pounds ➤ Stealth black color <p>All models: Max int disk capacity: 1.8TB² with six 300GB Ultra160 or Ultra320 SCSI hot-swap slimline HDDs</p>	<p>LIMITED WARRANTY³</p> <ul style="list-style-type: none"> ➤ 3 year parts and labor ➤ International Warranty Service³ ➤ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷ ➤ 3 year on site warranty service upgrade options (in eligible locations):⁷ <ul style="list-style-type: none"> • 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) ➤ 24x7¹⁴ toll-free support for warranty issues during the warranty period³
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See footnotes for important warranty information

• = Hot-swap

IBM® Type-model	Qty x Processor	L2 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8841-0RU-0Rx	1 x Xeon® 2.8GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006
8841-1RU-1Rx	1 x Xeon 3.0GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006
8841-1SU-1Sx	1 x Xeon 3.0GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006
8841-2RU-2Rx	1 x Xeon 3.2GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006
8841-3RU-3Rx	1 x Xeon 3.4GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006
8841-4RU-4Rx	1 x Xeon 3.6GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006
8841-5RU-5Rx	1 x Xeon 3.8GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Apr 2006

Positioning Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price
Processor Up to 1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6, 3.8 GHz with 800MHz frontside bus / **Extended Memory 64 Technology (EM64T)** / **Simultaneous Multi-threading (SMT)** / Hyper-Threading technology /
L2 cache 2MB / all models / on die of processor / at processor speed
SMP support 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, eight memory gold-connector DIMM slots, six PCI slots (one hot-swap Active™ PCI slots), and integrated SCSI, ethernet, graphics

Memory 1GB std / 16GB max / two slots used / six slots available / **PC2-3200** 400MHz registered 240-pin ECC **DDR2**-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2x200MHz / **Error Checking and Correcting (ECC)** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / **Active Memory™: memory mirroring, online-spare memory**

SCSI disk controller **Adaptec AIC 7902 / dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / **HostRAID** supports **RAID-0, 1 mirroring** with up to one hot-spare disk / optional IBM ServeRAID™-7k Controller for low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10, 50 (installed on internal connector)

SCSI channels Two 16-bit channels / **SCSI Channel B:** 16-bit 68-pin LVD cable from controller to backplane; **Channel A:** 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 24P7973) or via opt ServeRAID adapter with external connector(s)

IDE controller / cable Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)

Disk - capacity None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled

Disk - bays Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks

Mechanical Tower / conversion to EIA 19" Rack (5U⁴) via optional kit for support in IBM NetBAY™ Racks (13N0956)

Slots Two PCI-Express (one hot-plug), three PCI-X 64-bit (one 133MHz and two 100MHz), one 32-bit/33MHz slot

Chipset (see below) **Intel E7520 chipset** / Intel E7520 Memory Controller Hub (MCH): PXH, ICH5R, Dual Broadcom ethernet, two PCI-Express x8 slots (slots 2 & 3) / PXH: Bus A, two 64-bit/100MHz PCI-X slots (slots 4 & 5), Adaptec SCSI Bus B, one 64-bit/133MHz Hot-Plug slot (slot 6) / ICH5R: one 32-bit/33MHz slot (slot 1), ATI video, EIDE, USB, SMBus, LPC bus to Super I/O / NS PC87417 Super I/O

Ethernet controller **Dual 10/100/1000 gigabit** / Broadcom® BCM 5721 / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format (2.0) / IPMI (1.5)

CD-ROM / diskette 48X-20X® CD-ROM / IDE / 1.6" HH; **Diskette:** 3.5" 1.44MB diskette drive / dust cover

Rear ports Rear: two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin), graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)

Front port / graphics Front: one USB (Vers 2.0); **Graphics:** SVGA / ATI® Radeon™ 7000M / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2

Security Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot

Xeon 2.8GHz/2MB L2 Cache Proc Upg	40K2503
Xeon 3.0GHz/2MB L2 Cache Proc Upg	40K2504
Xeon 3.2GHz/2MB L2 Cache Proc Upg	40K2505
Xeon 3.4GHz/2MB L2 Cache Proc Upg	40K2506
Xeon 3.6GHz/2MB L2 Cache Proc Upg	40K2507
Xeon 3.8GHz/2MB L2 Cache Proc Upg	40K2508
512MB (2x256) PC2-3200 CL3 ECC DDR2 non-Chipk	73P3523
1GB (2x512) PC2-3200 CL3 ECC DDR2 non-Chipk	39M5818
1GB (2x512) PC2-3200 CL3 ECC DDR2 RDIMM	39M5821
2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM	39M5809
73.4GB 10K Ultra320 SCSI Hot-Swap SSL HDD	40K1023
146.4GB 10K Ultra320 SCSI Hot-Swap SSL HDD	40K1024
73.4GB 15K Ultra320 SCSI Hot-Swap SSL HDD	30R5097
IBM ServeRAID-7k Controller	71K8642
IBM Remote Supervisor Adapter II Slimline	73P9341
3-Pack Ultra320 Hot-Swap Expansion Kit	33P2751
IBM 670W Hot-Swap Power Upgrade Kit (NA)	25K9560

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

Systems mgmt **IBM Integrated system management processor (ISMP)** / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 20-pin connector on planar for continuous power (std on 32y) (no ext pwr reqd)

Diagnostics **Light Path Diagnostics™** panel providing LED map to failing part (under side cover) / Information LED Panel in front

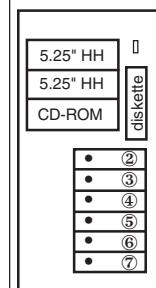
Software **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, others

Keyboard / mouse IBM 101-key keyboard / IBM mouse (both black)

Power supply std/max: one/two 670 watt / voltage-sensing / auto-restart /

Fans Fan in each std/max: four/six/ two fans (front), two fans on planar, (Opt) two fans (rear) / variable speed / hot-swap / redundant with optional rear fans / PFA / fan in each power supply

- Slot 1: half-length, 32-bit 33MHz 5v PCI 2.2, Bus A
- Slot 2: full, PCI-Express x4, Bus B
- Slot 3: full, PCI-Express x4, Bus C
- Slot 4: full, 64-bit 100MHz 3.3v PCI-X, Bus D
- Slot 5: full, 64-bit 100MHz 3.3v PCI-X, Bus D
- Slot 6: full, 64-bit 133MHz 3.3v PCI-X, hot-swap, Bus E



- Bay ① 3.5", SL 1", access, diskette
- Bay ② 3.5", SL 1", access, hot-swap
- 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
- Bay ⑥ 3.5", SL 1", access, hot-swap
- Bay ⑦ 3.5", SL 1", access, hot-swap
- Bay ⑧ 5.25", HH 1.6" access, open**
- Bay ⑨ 5.25", HH 1.6" access, open**
- Bay ⑩ 5.25", HH 1.6" access, CD-ROM

Bays 2 through 7 support 6 SL disks via SCA-2 connectors.

**Bays 8 and 9 support three 3.5" disks via 3-Pack Kit 33P2751

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- Adaptec Configuration Utility near startup by pressing CTRL+I
- Diagnostics (PC-Doctor™) by pressing F2 at startup
- ACPI2.0-compliant
- Operator Information Panel (in front)
- 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
- Tower: H 17.31" x W 8.5" x D 27.6"
- 74 to 101 pounds
- Stealth black color

All models: Max int disk capacity: 1.8TB² with six 300GB Ultra160 or Ultra320 SCSI hot-swap slimline HDDs

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 time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 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)
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-model	Qty x Processor	L2 cache	Memory	DIMM slots	Memory Cards	Disks	SCSI controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8865-11Y	1 x Xeon™ MP 3.16GHz	1MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	Sep 2005
8865-12Y	1 x Xeon™ MP 3.16GHz	1MB	1GB(2x512MB)	4	One	None	SAS	Tower	6x12	2 x775W	3	Sep 2005
8865-1RY	1 x Xeon™ MP 3.16GHz	1MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005
8865-1SY	1 x Xeon™ MP 3.16GHz	1MB	1GB(2x512MB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005
8865-21Y	1 x Xeon™ MP 3.66GHz	1MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	Sep 2005
8865-2RY	1 x Xeon™ MP 3.66GHz	1MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005
8865-E1Y	2 x Xeon™ MP 3.66GHz	1MB	4GB(4x1GB)	8	Two	None	SAS	Tower	6x12	2 x775W	3	Sep 2005
8865-E2Y	1 x Xeon™ MP 3.16GHz	1MB	1GB(2x512MB)	8	Two	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005

Processors	One or two 64-bit Intel® Xeon™ Processor MP 3.16 or 3.66GHz² with 667MHz frontside bus std / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading technology																																
L2 cache	1MB / on die of processor / at processor speed / Xcel4v™ Dynamic Server Cache																																
Processor upgrade Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics																																
Active Memory™	Up to 4GB std / 64GB max ^{12,13} (with 4GB DIMMs) using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ / Memory ProteXion™ (redundant bit steering) and Memory Mirroring™ and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)																																
SAS disk controller	ALL: Adaptec® AIC-9410 / Dual-channel Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0																																
SAS connectors	Dual channel Controller wired to dual SAS backplanes																																
SAS cabling	Hot-swap bays connect to integrated SAS controller through SAS expander, 1 cable for each of the 2 SAS backplanes																																
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge																																
Disk - capacity	Max: 3.6TB-10k / supports up to 15,000 rpm disks																																
Disk - bays	Up to Twelve 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays																																
Mechanical	EIA 19" rack models (7U⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)																																
Chipset	IBM XA-64e™ 3rd Generation chipset / IBM Integrated Processor/Memory Controller (improved performance from earlier models) / 2 IBM PCI-X 2.0 Host Bridges / 1 supports adapter PCI 33MHz and 66MHz, slot for optional ServerRAID 8i (inc. graphics), ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge supports 4 PCI-X 2.0 slots																																
I/O Slots	Six total Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz																																
CD-ROM / diskette	IBM 24X Max SlimLine CD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive																																
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2																																
Graphics controller	SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																																
Ports	Rear: RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (Ver 2.0)																																
Security	Power-on and administrator passwords / unattended boot / selectable boot																																
Systems management	BMC standard / Remote Supervisor Adapter II slimline (optional) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies																																
Diagnostics	Drop-down Light Path Diagnostics / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running																																
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others																																
Keyboard / mouse	Rack model: none standard / Tower model: IBM 104-key keyboard (PS/2) / IBM 3-button optical mouse (PS/2)																																
Power supplies	Std: two 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA																																
Cooling fans	Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor																																
Options	<table border="0"> <tr> <td>1GB PC2-3200 CL3 ECC RDIMM (2x512MB)</td> <td>73P2865</td> <td>IBM ServeRAID 6M U320 256MB Adapter</td> <td>02R0988</td> </tr> <tr> <td>2GB PC2-3200 CL3 ECC RDIMM (2x1GB)</td> <td>73P2866</td> <td>IBM 73.4GB 10K 3.5" SAS Hot-swap HDD</td> <td>26K5709</td> </tr> <tr> <td>4GB PC2-3200 CL3 ECC RDIMM (2x2GB)</td> <td>73P2867</td> <td>IBM 146GB 10K 3.5" SAS Hot-Swap HDD</td> <td>26K5710</td> </tr> <tr> <td>Active Memory 4-slot Expansion Card</td> <td>13M7409</td> <td>IBM 300GB 10K 3.5" SAS Hot-Swap HDD</td> <td>26K5711</td> </tr> <tr> <td>Xeon MP 3.16GHz/1MB L2 Cache Proc Upg</td> <td>13N0694</td> <td>Remote Supervisor Adapter II Slimline</td> <td>59P2984</td> </tr> <tr> <td>Xeon MP 3.66GHz/1MB L2 Cache Proc Upg</td> <td>13N0695</td> <td>SAS 3.5" 6-drive Backplane</td> <td>13M7864</td> </tr> <tr> <td>775 watt Hot-Swap Power Supply (WW)</td> <td>13M7415</td> <td>IBM 73.4GB 15K 3.5" SAS Hot-swap HDD</td> <td>26K5698</td> </tr> <tr> <td>IBM ServeRAID™-8i SA-SCSI Adapter</td> <td>13N2227</td> <td>IBM 146GB 15K 3.5" SAS Hot-Swap HDD</td> <td>26K5699</td> </tr> </table>	1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	73P2865	IBM ServeRAID 6M U320 256MB Adapter	02R0988	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	26K5709	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	26K5710	Active Memory 4-slot Expansion Card	13M7409	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	26K5711	Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	13N0694	Remote Supervisor Adapter II Slimline	59P2984	Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	13N0695	SAS 3.5" 6-drive Backplane	13M7864	775 watt Hot-Swap Power Supply (WW)	13M7415	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	26K5698	IBM ServeRAID™-8i SA-SCSI Adapter	13N2227	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	26K5699
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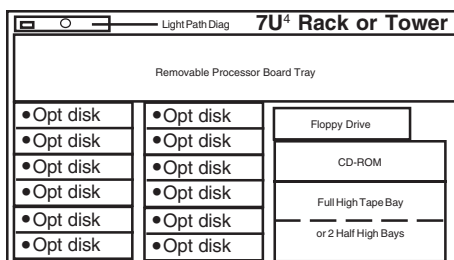
<p>LIMITED WARRANTY³</p> <ul style="list-style-type: none"> ↪ 3 year parts and labor ↪ International Warranty Service³ ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷ ↪ On site service upgrade options (in eligible locations):⁷ <ul style="list-style-type: none"> • 3 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2253) • 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2254) • 4 year IOR 9x5, NBD response (ServicePac part num 96P2255) • 5 year IOR 9x5, NBD response (ServicePac part num 69P2259) ↪ Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomx.eu.pdf ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period³ 	<p>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</p>	<ul style="list-style-type: none"> ↪ Stealth black color ↪ Tool-free serviceability ↪ Tower Dimensions: H15.5" x W18.2" x D30"(762mm) ↪ Tower Weight: 149 to 180lbs; 67.6 to 81.7Kg ↪ Rack Dimensions: H12" x W17.5" x D28.2" ↪ Rack Dimensions: H306mm x W444mm x D715mm ↪ Rack Weight: 144 to 158lbs; 65.4 to 71.7Kg ↪ Access adapters, fans, and memory from top ↪ Access processors and systemboard from front ↪ Access power supplies from back ↪ Setup Program by pressing F1 at startup ↪ Diagnostics (PC-Doctor) by pressing F2 at startup ↪ SCSISelect by pressing Ctrl+A at startup ↪ Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover ↪ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director
		<p>BTU Output: Ship Config: 2,006 Btu/hr (588 watts) Full Config: 6,346 Btu/hr (1860 watts)</p>
<p>All models: Maximum internal disk capacity: 3.6TB with 12x 300GB² hot-swap SAS disks</p>		

IBM® Type-model	Qty x Processor	L2 cache	Memory	DIMM slots	Memory Cards	Disks	SCSI controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date																				
8865-11Y	1 x Xeon™ MP 3.16GHz	1MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	Sep 2005																				
8865-12Y	1 x Xeon™ MP 3.16GHz	1MB	1GB(2x512MB)	4	One	None	SAS	Tower	6x12	2 x775W	3	Sep 2005																				
8865-1RY	1 x Xeon™ MP 3.16GHz	1MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005																				
8865-1SY	1 x Xeon™ MP 3.16GHz	1MB	1GB(2x512MB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005																				
8865-21Y	1 x Xeon™ MP 3.66GHz	1MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	Sep 2005																				
8865-2RY	1 x Xeon™ MP 3.66GHz	1MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005																				
8865-E1Y	2 x Xeon™ MP 3.66GHz	1MB	4GB(4x1GB)	8	Two	None	SAS	Tower	6x12	2 x775W	3	Sep 2005																				
8865-E2Y	1 x Xeon™ MP 3.16GHz	1MB	1GB(2x512MB)	8	Two	None	SAS	7U Rack	6x12	2 x775W	3	Sep 2005																				
Processors	One or two 64-bit Intel® Xeon™ Processor MP 3.16 or 3.66GHz ² with 667MHz frontside bus std / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading technology																															
L2 cache	1MB / on die of processor / at processor speed / Xcel4™ Dynamic Server Cache																															
Processor upgrade Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics																															
Active Memory™	Up to 4GB std / 64GB max ^{12,13} (with 4GB DIMMs) using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ / Memory ProteXion™ (redundant bit steering) and Memory Mirroring™ and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)																															
SAS disk controller	ALL: Adaptec® AIC-9410 / Dual-channel Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0																															
SAS connectors	Dual channel Controller wired to dual SAS backplanes																															
SAS cabling	Hot-swap bays connect to integrated SAS controller through SAS expander, 1 cable for each of the 2 SAS backplanes																															
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge																															
Disk - capacity	Max: 3.6TB-10k / supports up to 15,000 rpm disks																															
Disk - bays	Up to Twelve 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays																															
Mechanical	EIA 19" rack models (7U ⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)																															
Chipset	IBM XA-64e™ 3rd Generation chipset / IBM Integrated Processor/Memory Controller (improved performance from earlier models) / 2 IBM PCI-X 2.0 Host Bridges / 1 supports adapter PCI 33MHz and 66MHz, slot for optional ServerRAID 8i (inc. graphics), ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge supports 4 PCI-X 2.0 slots																															
I/O Slots	Six total Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz																															
CD-ROM / diskette	IBM 24X Max SlimLine CD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive																															
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2																															
Graphics controller	SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																															
Ports	Rear: RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (Ver 2.0)																															
Security	Power-on and administrator passwords / unattended boot / selectable boot																															
Systems management	BMC standard / Remote Supervisor Adapter II slimline (optional) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies																															
Diagnostics	Drop-down Light Path Diagnostics / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running																															
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others																															
Keyboard / mouse	None standard (because rack-based)																															
Power supplies	Std: two 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA																															
Cooling fans	Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor																															
Options	1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	73P2865	IBM ServeRAID 6M U320 256MB Adapter	02R0988	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	26K5709	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	26K5710	Active Memory 4-slot Expansion Card	13M7409	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	26K5711	Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	13N0694	Remote Supervisor Adapter II Slimline	59P2984	Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	13N0695	SAS 3.5" 6-drive Backplane	13M7864	775 watt Hot-Swap Power Supply (WW)	13M7415	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	26K5698	IBM ServerRAID™-8i SA-SCSI Adapter	13N2227	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	26K5699

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 time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 96P2253)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac partnum 96P2254)
 - 4 year IOR 9x5, NBD response (ServicePac partnum 96P2255)
 - 5 year IOR 9x5, NBD response (ServicePac partnum 69P2259)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

- 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



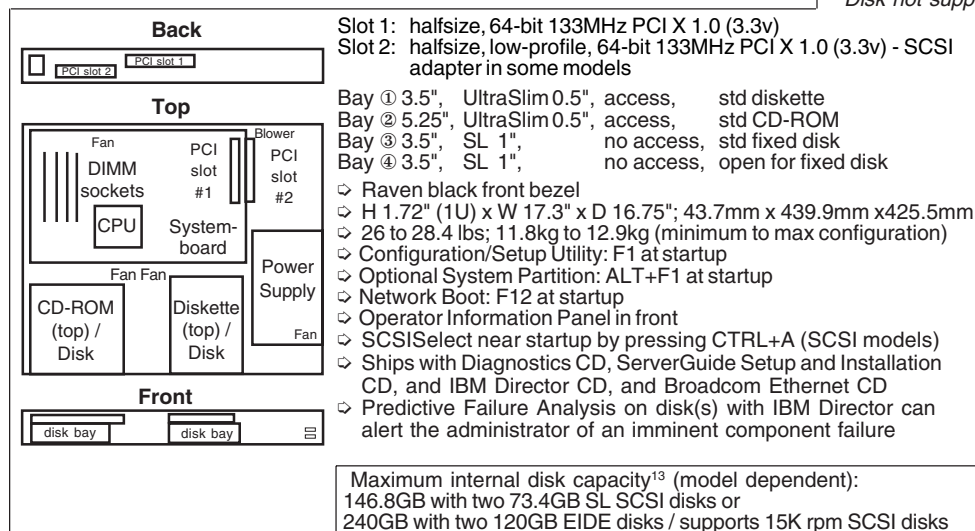
- Stealth black color
- Tool-free serviceability
- Tower Dimensions: H15.5" x W18.2" x D30"(762mm)
- Tower Weight: 149 to 180lbs; 67.6 to 81.7Kg
- Rack Dimensions: H12" x W17.5" x D28.2"
- Rack Dimensions: H306mm x W444mm x D715mm
- Rack Weight: 144 to 158lbs; 65.4 to 71.7Kg
- Access adapters, fans, and memory from top
- Access processors and systemboard from front
- Access power supplies from back
- Setup Program by pressing F1 at startup
- Diagnostics (PC-Doctor) by pressing F2 at startup
- SCSISelect by pressing Ctrl+A at startup
- Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
- Predictive Failure Analysis[®] alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

BTU Output:
Ship Config: 2,006 Btu/hr (588 watts)
Full Config: 6,346 Btu/hr (1860 watts)

All models: Maximum internal disk capacity: 3.6TB with 12x 300GB² hot-swap SAS disks

IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Limited warranty ³	Available date	
8673-72X	Pentium 4	2.8BGHz	512KB	533	256MB	ECC	40GB EIDE	ATA-100	2 fixed	1U rack	2x4	2 x Gigabit	1 year	May2003
8673-73X	Pentium 4	2.8BGHz	512KB	533	256MB	ECC	18.2GB SCSI	Ultra160	2 fixed	1U rack	2x4	2 x Gigabit	1 year	May2003
8673-82X	Pentium 4	3.06GHz	512KB	533	256MB	ECC	40GB EIDE	ATA-100	2 fixed	1U rack	2x4	2 x Gigabit	1 year	Sep 2003
8673-83X	Pentium 4	3.06GHz	512KB	533	256MB	ECC	36.4GB SCSI	Ultra160	2 fixed	1U rack	2x4	2 x Gigabit	1 year	Sep 2003

Positioning	<i>A highly affordable, uni-processor, 1U rack-optimized server</i>												
Processor(s)	Intel® Pentium 4 up to 2.8BGHz¹ with 533MHz frontside bus (FSB)												
L2 cache	512KB / on die of processor / at processor speed (no L3 cache)												
SMP support	No SMP support												
Implementation	Systemboard contains one Intel mPGA478B socket (with Pentium 4 FC-PGA2 and heatsink), four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated chipset, two EIDE connectors, ethernet, and graphics												
Memory	256MB std / 4GB max ¹³ / one slot used / three slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / memory bus runs at 2 x 133MHz / Error Checking and Correcting (ECC) memory controller												
SCSI disk controller	<i>SCSI models:</i> Adaptec® 29160LP / single channel Wide Ultra160 SCSI (LVD 160MB/sec) / 64-bit 66MHz PCI adapter / one channel with up to 15 device support												
SCSI connectors	<i>SCSI models:</i> On adapter: one 68-pin SCSI connector												
IDE disk controller	Enhanced IDE busmaster / ATA-100 support / two connectors on systemboard												
Cables	<i>SCSI models:</i> one 2-drop 16-bit LVD SCSI cable, one 1-drop 40-conductor EIDE cable (connected to CD-ROM)												
Disk - features	<i>EIDE models:</i> one 2-drop EIDE cable (to CD-ROM and disk), one 1-drop EIDE cable (to second disk bay) <i>SCSI:</i> 18.2GB/36.4GB Ultra160 SCSI, 10K rpm, 5.2ms read seek; <i>EIDE:</i> 40GB ATA-100, 7200 rpm, 8.7ms read; <i>All:</i> S.M.A.R.T. ⁵												
Mechanical Architecture / chipsets	EIA 19" Rack (1U*) / rack-mount only / supports 16.75" deep racks for telco and colocation implementations ServerWorks® Grand Champion™ SL / CMIC-SL (Super Lite) Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB bus to Host Bridge for PCI-X Bus A with slots and PCI-X Bus B with dual ethernet) / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2-based graphics controller, EIDE, USB, LPC bus to Super I/O) / National Semiconductor® PC87414 Super I/O chip (serial, keyboard, mouse, diskette)												
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots												
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom® BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / PXE / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports												
CD-ROM / diskette	24X-10X ⁶ CD-ROM / IDE; <i>Diskette:</i> 3.5" 1.44MB diskette drive / dust cover												
Rear ports	<i>Rear:</i> serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port												
Front ports / graphics	<i>Front:</i> two USB (Vers 1.1); <i>Graphics:</i> SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus												
Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)												
Systems mgmt	WinBond® W83791D / on planar / monitors system and processor temperature, fan speed and failure, and voltages												
Diagnostics	Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter with 20-pin conn on planar for continuous power (no external power required)												
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode												
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others												
Cooling fans	Five fans (three fans for system, one blower in rear, one on power supply) / variable speed / not redundant or hot-swap												
Power supply	200 watt / universal / auto-sensing / auto-restart support												
Prerequisites	Monitor, keyboard, mouse, rack, operating system / supports IBM ACT CAT-5 chaining solutions												
	256MB PC2100 CL2.5 ECC DDR-SDRAM DIMM33L5037 512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM33L5038 1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5039 120GB ATA-100 EIDE HDD (7200 rpm)* 09N4231 18.2GB 15K Ultra160 SCSI SL 68-pin HDD* 06P5765 36.4GB 15K Ultra160 SCSI SL 68-pin HDD* 06P5766 73.4GB 10K Ultra160 SCSI SL 68-pin HDD* 06P5752 Remote Supervisor Adapter 09N7585 ServeRAID™-4Lx Ultra160 SCSI Adapter 06P5740 IBM T541 15" Flat Panel Color Monitor (black) 9512AB1 IBM NetBAY25 Standard Rack 9306250 IBM NetBAY42 Enterprise Rack 930842S IBM ACT Local Console Manager 1735L04 Other options at ibm.com/pc/us/accessories * Disk not supported in all x305 systems												



LIMITED WARRANTY³

- 1 year parts and labor
- International Warranty Service³
- 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)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
 US models announced May 13, 2003 or September 9, 2003

For GAV systems, lowercase "v" should be replaced with a country-specific code.

IBM® Machine Type	GAV model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr ³	Available date
8849/8491	10y-10x	Pentium® 4 531 3.0GHz	1MB	800	512MB	SATA	2 simple-swap	1U ⁴ rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8491	1Ay-Ax	Pentium 4 531 3.0GHz	1MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8491	20y-20x	Pentium D 830 3.0GHz	2x1MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8491	30y-30x	Pentium 4 640 3.2GHz	2MB	800	512MB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8491	3Ay-3Ax	Pentium 4 640 3.2GHz	2MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8491	40y-40x	Pentium 4 650 3.4GHz	2MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8491	50y-50x	Pentium 4 660 3.6GHz	2MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005

Positioning *A highly affordable, uni-processor, 1U rack-optimized server*
 Processor(s) **Intel® Pentium 4 up to 3.6GHz Single Core 800MHz FSB / Pentium D 3.0GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
 L2 cache **Up to 2MB std on Pentium 4 / 2x1MB std on Pentium D / ECC / full speed**
 SMP support **No SMP support**
 Implementation **Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two slots: some: (1 PCI Express x8, 1 PCI-X) some: (2 PCI-X)**

Memory **512MB std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one socket used / PC2-4200 533MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC) / DIMMs and ECC memory controller / industry std / unbuffered**

SCSI disk controller **SAS models: Adaptec® 9405 chipset / single channel / on planar / Integrated Raid 8e (Raid 0 or 1)**
 SATA disk controller **SATA models: Integrated Intel controller / two-channel / on planar / Integrated Raid 8e (Raid 0 or 1)**
 IDE disk controller **Enhanced IDE busmaster / ATA-100 support / one connector on systemboard**
 Cables **SAS models: one 1-drop EIDE cable (connected to CD-ROM)**
SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to CD-ROM)
 Disk **None standard**

Mechanical **EIA 22" Rack (1U⁴) / rack-mount only**
 Architecture / chipsets **Intel E7210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse**
 Bus slots **(See below) two available PCI-X 1.0 100MHz or one 64-bit PCI-E x8 and one PCI-X 1.0 100MHz / no hot-swap Active™ PCI slots /**

Ethernet controllers **Dual Gigabit 10/100/1000 ethernet ports / Broadcom 5721 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)**

CD-ROM / diskette **24X-10X⁶ CD-ROM Slim/ IDE; Diskette: none**
 Rear ports **Rear: serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)**
 Front ports / Graphics **Front: two USB (Vers 2.0)**
ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

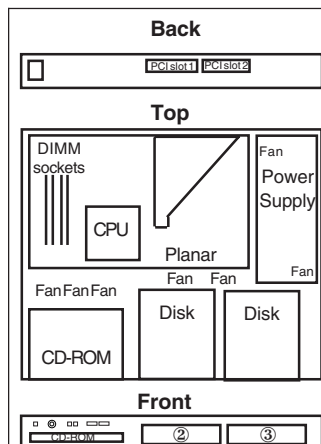
Console interconnects **No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)**
 Systems mgmt **Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages**

Diagnostics **Diagnostic LEDs/ Error LEDs for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter II with 20-pin conn on planar for continuous power (no external power required)**

Security **Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / secure remote power on / off via IPMI 1.5**
 Software **ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™ and others**

Cooling fans **Seven fans (five fans for system, two on power supply) / variable speed / not redundant or hot-swap**
 Power supply **350 watt / universal / auto-sensing / auto-restart support**
 Prerequisites **Monitor, keyboard, mouse, rack**

512MB PC2-4200 CL3 ECC DDR2RoHS	30R5148
2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5149
4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
80GB Hot-Swap SATA HDD	39M4518
160GB Hot-Swap SATA HDD	39M4522
250GB Hot-Swap SATA HDD	39M4526
73GB 10K 3.5" SAS Hot-Swap HDD	26K5709
146GB 10K 3.5" SAS Hot-Swap HDD	26K5710
300GB 10K 3.5" SAS Hot-Swap HDD	26K5711
36GB 15K 3.5" SAS Hot-Swap HDD	26K5697
73GB 15K 3.5" SAS Hot-Swap HDD	26K5698
146GB 15K 3.5" SAS Hot-Swap HDD	26K5699
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM ServeRAID-7i SATA Integrated Controller	71P8648



- Some:
 Slot 1: 3/4 length, full height, 64-bit 100MHz PCI X 1.0 (3.3v)
 Slot 2: half length, low-profile, 64-bit 100MHz PCI X 1.0 (3.3v)
 Some:
 Slot 1: 3/4 length, full height, 64-bit 100MHz PCI X 1.0 (3.3v)
 Slot 2: half length, low-profile, PCI-E x8
 Bay ① 5.25", UltraSlim 0.5", access, std CD-ROM
 Bay ② 3.5", SL 1", access, open for fixed disk
 Bay ③ 3.5", SL 1", access, open for fixed disk
- ❖ Raven black front bezel
 - ❖ H 1.75" (1U) x W 17.3" x D 22"; 43mm x 440mm x 559mm
 - ❖ 24.25 to 30 lbs; 11kg to 12.7kg (minimum to max configuration)
 - ❖ Configuration/Setup Utility: F1 at startup
 - ❖ Network Boot: F12 at startup
 - ❖ Operator Information Panel in front
 - ❖ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
 - ❖ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

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

LIMITED WARRANTY³

- ❖ 1 year parts and labor standard 8849 MTM
- ❖ 3 year parts and labor standard 8491 MTM
- ❖ International Warranty Service³
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD 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 response (ServicePac part num 69P9508)
- ❖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ❖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Maximum internal disk capacity¹³ (model dependent):
 600GB with two 300GB SAS disks or 500GB with two 250GB SATA disks

See footnotes for important warranty information

For GAV systems, lowercase "v" should be replaced with a country-specific code.

IBM® Machine Type	GAV model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr ³	Available date
8849/8891	B2y-B2x	Pentium® 4 631 3.0GHz	2MB	800	512MB	SATA	2 simple-swap	1U ⁴ rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8891	G2y-G2x	Pentium D 920 2.8GHz	4MB	800	1GB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8891	G4y-G4x	Pentium D 920 2.8GHz	4MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8891	H2y-H2x	Pentium D 930 3.0GHz	4MB	800	1GB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8891	H4y-H4x	Pentium D 930 3.0GHz	4MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8891	J2y-J2x	Pentium D 940 3.2GHz	4MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006

Positioning A highly affordable, uni-processor, 1U rack-optimized server
Processor(s) Intel® Pentium 4 up to 3.0GHz Single-Core 800MHz FSB / Pentium D up to 3.2GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
L2 cache 2MB std on Pentium 4 / 4MB std on Pentium D / ECC / full speed
SMP support No SMP support
Implementation Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two slots: some: (1 PCI Express® x8, 1 PCI-X) some: (2 PCI-X)

Memory 512MB or 1GB std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one socket used / PC2-4200 533MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC) / DIMMs and ECC memory controller / industry std / unbuffered

SCSI disk controller SAS models: Adaptec® 9405 chipset / single-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
SATA disk controller SATA models: Integrated Intel controller / two-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
IDE disk controller Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Cables SAS models: one 1-drop EIDE cable (connected to CD-ROM)
 SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to CD-ROM)
Disk None standard

Mechanical Architecture / chipsets EIA 22" Rack (1U⁴) / rack-mount only
 Intel E7210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
Bus slots (See below) two available PCI-X 1.0 100MHz or one 64-bit PCIe™ x8 and one PCI-X 1.0 100MHz / no hot-swap Active™ PCI slots /

Ethernet controllers Dual-Gigabit 10/100/1000 ethernet ports / Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)

CD-ROM / diskette 24X-10X⁶ CD-ROM Slim/ IDE; Diskette: none
Rear ports Rear: serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)
Front ports / Graphics Front: two USB (Vers 2.0)
 ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Console interconnects No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages

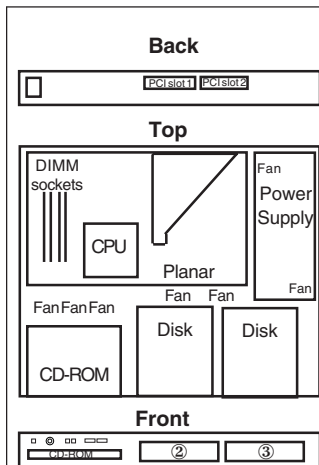
Diagnostics Diagnostic LEDs/ Error LEDs for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter II with 20-pin conn on planar for continuous power (no external power required)

Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / secure remote power on / off via IPMI 1.5
Software ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™ and others

Cooling fans Seven fans (five fans for system, two on power supply) / variable speed / not redundant or hot-swap
Power supply 350 watt / universal / auto-sensing / auto-restart support
Prerequisites Monitor, keyboard, mouse, rack

512MB PC2-4200 CL3 ECC DDR2RoHS	30R5148
2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5149
4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
80GB Hot-Swap SATA HDD	39M4518
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250GB Hot-Swap SATA HDD	39M4526
73GB 10K 3.5" SAS Hot-Swap HDD	26K5709
146GB 10K 3.5" SAS Hot-Swap HDD	26K5710
300GB 10K 3.5" SAS Hot-Swap HDD	26K5711
36GB 15K 3.5" SAS Hot-Swap HDD	26K5697
73GB 15K 3.5" SAS Hot-Swap HDD	26K5698
146GB 15K 3.5" SAS Hot-Swap HDD	26K5699
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM ServeRAID-7i SATA Integrated Controller	71P8648

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



- Some:
- Slot 1: 3/4 length, full height, 64-bit 100MHz PCI X 1.0 (3.3v)
 - Slot 2: half length, low-profile, 64-bit 100MHz PCI X 1.0 (3.3v)
- Some:
- Slot 1: 3/4 length, full height, 64-bit 100MHz PCI X 1.0 (3.3v)
 - Slot 2: half length, low-profile, PCIe x8
- Bay ① 5.25", UltraSlim 0.5", access, std CD-ROM
 Bay ② 3.5", SL 1", access, open for fixed disk
 Bay ③ 3.5", SL 1", access, open for fixed disk
- ❖ Raven black front bezel
 - ❖ H 1.75" (1U) x W 17.3" x D 22"; 43mm x 440mm x 559mm
 - ❖ 24.25 to 30 lbs; 11kg to 12.7kg (minimum to max configuration)
 - ❖ Configuration/Setup Utility: F1 at startup
 - ❖ Network Boot: F12 at startup
 - ❖ Operator Information Panel in front
 - ❖ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
 - ❖ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity¹³ (model dependent):
 600GB with two 300GB SAS disks or 500GB with two 250GB SATA disks

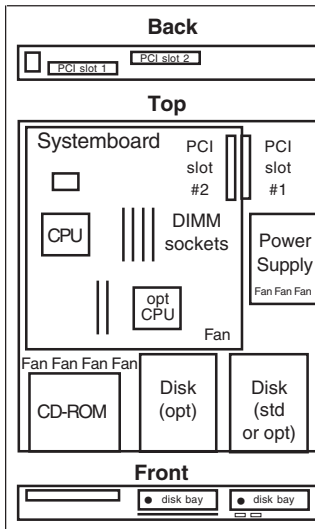
LIMITED WARRANTY³

- ❖ 1 year parts and labor standard 8849 MTM
- ❖ 3 year parts and labor standard 8491 MTM
- ❖ International Warranty Service³
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD 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 response (ServicePac part num 69P9508)
- ❖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ❖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

IBM® Type-model	Qty x Processor	Proc. Speed	L2 Cache	Memory	Memory type	Disk	Disk controller	Hot-swap or fixed disk bays	Slots x bays	Limited warranty ³	Available date
8835-21X	1 x Opteron™ 240	1.4Ghz ¹	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit Ethernet	1 year Oct 2003
8835-22X	1 x Opteron 240	1.4Ghz	1MB	1GB	Chipkill	80GB ² EIDE	EIDE	2 fixed	2x3	2 x Gigabit Ethernet	1 year Oct 2003
8835-31X	1 x Opteron 242	1.6Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit Ethernet	1 year Oct 2003
8835-32X	1 x Opteron 242	1.6Ghz	1MB	1GB	Chipkill	80GB ² EIDE	EIDE	2 fixed	2x3	2 x Gigabit Ethernet	1 year Oct 2003
8835-51X	1 x Opteron 246	2.0Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit Ethernet	1 year Oct 2003
8835-52X	1 x Opteron 246	2.0Ghz	1MB	1GB	Chipkill	80GB ² EIDE	EIDE	2 fixed	2x3	2 x Gigabit Ethernet	1 year Oct 2003
8835-5DX	2 x Opteron 246	2.0Ghz	1MB	2GB	Chipkill	36.4GB 10K	Ultra320	2 hot-swap	2x3	2 x Gigabit Ethernet	1 year Oct 2003
Processor(s)	Up to 2 x AMD® Opteron™ 246 with 800Mhz HyperTransport technology / 64-bit x86 Instruction set / 32-bit compatible										
L2 cache	1MB / on die of processor / at processor speed (no L3 cache)										
SMP support Implementation	2-way SMP / up to two Opteron Processors (same speed/cache size required) Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, six memory DIMM slots, two 64-bit 100Mhz PCI-X slots, integrated SCSI, ethernet, graphics / AMD Opteron HyperLink bus interface										
Memory	Up to 2GB std / 12GB max ¹³ (when 2GB DIMMs become available) / four slots enabled with uni-processor, six with dual / two slots used (four slots used in 5DX model) / four slots available (two avail. in 5DX) / PC2700 333MHz registered 184-pin ECC DDR-SDRAM DIMMs / six DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)										
SCSI disk controller	All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector										
IDE controller / cable	All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays (primary) / one 1-drop EIDE cable to CD-ROM (secondary)										
Disk - capacity	SCSI models: 36.4GB supports up to 15000 rpm disks; EIDE models: 80GB / 7200 rpm / ATA-100 / 8.7ms seek										
Disk - bays	SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled										
Mechanical Architecture / chipsets	EIA 19" Rack (1U ⁴) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products AMD® 8131 PCI-X Bridge Chip providing two PCI-X bridges running at 100MHz (bridge A for SCSI and Ethernet; bridge B for PCI-X expansion slots) / 8111 I/O HyperTransport Bridge Chip supporting a 200 Mhz double-pumped HyperTransport clock (PCI, AC '97, Ethernet, SMBus, USB, EIDE, LPC to BIOS and Super I/O) / National Semiconductor® PC87366 Super I/O chip										
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots										
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5704 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports										
CD-ROM/diskette/kbd Rear ports	24X-10X ⁵ CD-ROM / IDE / Diskette and keyboard: none (USB diskette and keyboard optional); legacy not supported Rear: two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported										
Front ports / graphics Console interconnects	Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus A C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported										
Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / optional Remote Supervisor Adapter II card not supported							Opteron 240 Processor Upgrade		24P8189	
Diagnosics	Diagnositic LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported							Opteron 242 Processor Upgrade		24P8190	
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode							Opteron 246 Processor Upgrade		13N0700	
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others							512MB PC2700 CL2.5 ECC DDR-SDRAM RDIMM		73P2266	
Cooling fans	Eight fans (five for system, three inside power supply) / variable speed / not redundant or hot-swap							1GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM		73P2267	
Power supply Prerequisites	411 watt / universal / auto-sensing / auto-restart support Monitor, keyboard, mouse, rack, disk (some), operating sys							2GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM		73P2269	
								80GB ATA-100 EIDE HDD*		09N4226	
								120GB ATA-100 EIDE HDD*		09N4231	
								36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*		32P0734	
								73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*		32P0735	
								IBM TotalStorage FC2-133 Host Bus Adapter		24P0960	
								IBM ServeRAID-6M SCSI (256MB Cache)		02R0988	
								USB Portable Diskette Drive		05K9276	
								NetBAY ACT Local Console Manager (LCM)		1735L04	
								NetBAY Remote Console Manager (RCM)		1735R16	
								1.5M USB Conversion Option		73P5832	

* Disk not supported in all e325 systems



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

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

- Stealth black color front bezel
- Utility tray in front slides out from under middle bay (USB devices)
- H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x 653.3mm
- 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity¹³ (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY³

- 1 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9399)
 - 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2119)
 - 2 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2120)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9507)
 - 3 year IOR 9x5, NBD response (ServicePac part num 69P9506)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

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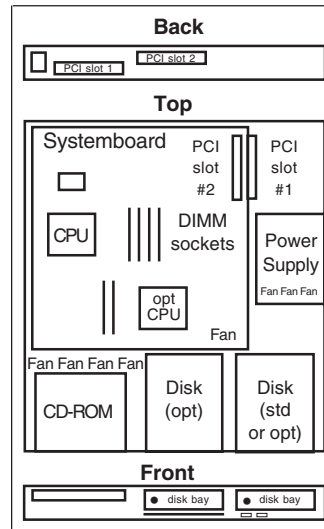
• = Hot-swap in some models

US models announced August 5, 2003

⊗ US models withdrawn effective May 28, 2004 (21X, 22X) and June 29, 2004 (5DX)

IBM® Type-model	Qty x Processor	Proc. Speed	L2 Cache	Memory	Memory type	Disk	Disk controller	Hot-swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
8835-61X	1 x Opteron™ 248	2.2Ghz ¹	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Jan 2004
8835-62X	1 x Opteron 248	2.2Ghz	1MB	1GB	Chipkill	80GB ² EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Jan 2004
8835-71X	1 x Opteron 250	2.4Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Jun 2004
8835-72X	1 x Opteron 250	2.4Ghz	1MB	1GB	Chipkill	80GB EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Jun 2004

Processor(s) L2 cache SMP support Implementation	Up to 2 x AMD® Opteron™ 248 with 800Mhz HyperTransport technology / 64-bit x86 Instruction set / 32-bit compatible 1MB / on die of processor / at processor speed (no L3 cache) 2-way SMP / up to two Opteron Processors (same speed/cache size required) Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, six memory DIMM slots, two 64-bit 100Mhz PCI-X slots, integrated SCSI, ethernet, graphics / AMD Opteron HyperLink bus interface		
Memory	1GB std / 12GB max ¹³ / four slots enabled with uni-processor, six with dual / two slots used / four slots available / PC2700 333MHz registered 184-pin ECC DDR-SDRAM DIMMs / six DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2-bit through 8-bit errors contained in two chips)		
SCSI disk controller	<i>All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller</i> (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector		
IDE controller / cable	<i>All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays (primary) / one 1-drop EIDE cable to CD-ROM (secondary)</i>		
Disk - capacity Disk - bays	<i>SCSI models: 36.4GB supports up to 15000 rpm disks; EIDE models: 80GB / 7200 rpm / ATA-100 / 8.7ms seek</i> <i>SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled</i>		
Mechanical Architecture / chipsets	EIA 19" Rack (1U⁴) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products AMD® 8131 PCI-X Bridge Chip providing two PCI-X bridges running at 100Mhz (bridge A for SCSI and Ethernet; bridge B for PCI-X expansion slots) / 8111 I/O HyperTransport Bridge Chip supporting a 200 Mhz double-pumped HyperTransport clock (PCI, AC '97, Ethernet, SMBus, USB, EIDE, LPC to BIOS and Super I/O) / National Semiconductor® PC87366 Super I/O chip		
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots		
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5704 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports		
CD-ROM/diskette/kbd Rear ports Front ports / graphics Console interconnects	24X-10X ⁶ CD-ROM / IDE / <i>Diskette and keyboard: none</i> (USB diskette and keyboard optional); legacy not supported <i>Rear:</i> two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported <i>Front:</i> two USB (Vers 1.1); <i>Graphics:</i> SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus A C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported		
Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / Remote Supervisor Adapter II card not supported	Opteron 248 Processor Upgrade Opteron 250 Processor Upgrade	13N0701 13N0702
Diagnostics	Diagnostic LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported	512MB PC2700 CL2.5 ECC DDR-SDRAM RDIMM 1GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM 2GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2266 73P2267 73P2268
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	80GB ATA-100 EIDE HDD* 120GB ATA-100 EIDE HDD*	09N4226 09N4231
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* 73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* IBM TotalStorage FC2-133 Host Bus Adapter IBM ServeRAID-6M SCSI (256MB Cache) USB Portable Diskette Drive NetBAY ACT Local Console Manager (LCM)	32P0734 32P0735 24P0960 02R0988 05K9276 1735L04
Cooling fans	Eight fans (five for system, three inside power supply) / variable speed / not redundant or hot-swap	NetBAY Remote Console Manager (RCM) 1.5M USB Conversion Option	1735R16 73P5832
Power supply Prerequisites	411 watt / universal / auto-sensing / auto-restart support Monitor, keyboard, mouse, rack, disk (some), operating sys		



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

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

- Stealth black color front bezel
- Utility tray in front slides out from under middle bay (USB devices)
- H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x 653.3mm
- 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity¹³ (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY³

- 1 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9399)
 - 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2119)
 - 2 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2120)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9507)
 - 3 year IOR 9x5, NBD response (ServicePac part num 69P9506)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
• = Hot-swap in some models

IBM® Type-GAV	Qty x Processor/Core	Speed	L2 Cache	Memory	Disk / Controller	Disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
7969 - 46y-46x	1 x Opteron®265/DC	1.8GHz ¹	2MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 55y-55x	1 x Opteron 270/DC	2.0GHz	2MB	2x512MB Chipkill	none/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 56y-56x	1 x Opteron 270/DC	2.0GHz	2MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 65y-65x	1 x Opteron 275/DC	2.2GHz	2MB	2x512MB Chipkill	none/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 66y-66x	1 x Opteron 275/DC	2.2GHz	2MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 67y-67x	2 x Opteron 275/DC	2.2GHz	2x2MB	4x1GB Chipkill	2x36GB/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 68y-68x	2 x Opteron 275/DC	2.2GHz	2x2MB	4x1GB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 75y-75x	1 x Opteron 280/DC	2.4GHz	2MB	2x512MB Chipkill	none/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 76y-76x	1 x Opteron 280/DC	2.4GHz	2MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 81y-81x	1 x Opteron 252/SC	2.6GHz	1MB	2x512MB Chipkill	none/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 82y-82x	1 x Opteron 252/SC	2.6GHz	1MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 91y-91x	1 x Opteron 254/SC	2.8GHz	1MB	2x512MB Chipkill	none/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Oct 2005
7969 - 92y-92x	1 x Opteron 254/SC	2.8GHz	1MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Oct 2005

Positioning Processor(s) **Entry 2-way rack server for compute-intensive applications and dual core computing at an attractive price**
Up to 2 x AMD® Opteron™ 280 Dual Core or 254 Single Core / 800Mhz HyperTransport technology / Simultaneously supports 32-bit and 64-bit computing

L2 cache **1MB** / per core / at processor speed (no L3 cache)

SMP support **2-way SMP** / up to two Opteron Processors (same speed/cache size required)

Implementation Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, eight memory DIMM slots, integrated SATA or SCSI, ethernet, graphics, one PCI-E x8 and one 64-bit 133/100MHz PCI-X (option to convert PCI-X slot to second PCI-E x8)

Memory **1GB** std / 16GB max¹³ / four slots enabled with uni-processor, eight with dual / two slots used / six slots available / **PC3200** registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Chipkill™** supported

SCSI disk controller *All (not used on SATA models): LSI Logic® 53C1020 / Ultra320 SCSI controller* (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector

SATA controller/cable *All: SATA-150 controller / two connectors on planar / two 1-drop cables / 1 IDE*

Disk - capacity *SCSI models: some: open some: 36GB; SATA models: 80GB / 7200 rpm / 9.0ms seek*

Disk - bays *SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled, supports 15k drives*

Mechanical Architecture/chipsets **EIA 19" Rack (1U⁴)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products **ServerWorks HT2000 System I/O controller** connects to the processor sub-system via a 16x Hyper Transport Bus at 1GHz and provides PCI-E, PCI-X and Dual Gigabit Ethernet / **ServerWorks HT1000 South Bridge** interfaces system I/O to the HT2000 via a 8x Hyper Transport bus and provides PCI-X, SATA 2.0, USB 2.0, ATA 100 IDE, SMB, IOAPIC, Event Timer, Watchdog Timer, Interrupt controller and LPCI

Bus slots (See detail below) one full-length PCI-X 1.0 and one half length PCI-E x8 / option to convert PCI-X slot to PCI-E x8 / no hot-swap Active™ PCI slots

Ethernet controllers Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5780 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / two rear RJ-45 ports

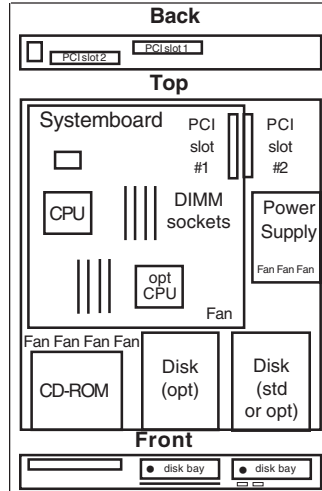
Optical/diskette/kbd 24X-10X⁶ CD-ROM / IDE / *Diskette and keyboard: none* (USB diskette and keyboard optional); legacy not supported

Rear ports *Rear: two USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45) / parallel port not supported*

Front ports / graphics *Front: two USB (Vers 2.0); Graphics: SVGA / ATI® RN50b / on planar / 16MB SDRAM std/max / 1024x768x32bit@85Hz*

Console interconnects C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported

Systems mgmt	Standard MS-9549 QLogic system management / IPMI 1.5 compliant / connector on planar / Remote Supervisor Adapter II optional	Opteron 252 Processor Upgrade Opteron 254 Processor Upgrade Opteron 265 Processor Upgrade Opteron 270 Processor Upgrade Opteron 275 Processor Upgrade Opteron 280 Processor Upgrade	13N0703 32R2215 32R2021 25R8960 32R2023 25R8966 39M5800
Diagnostics	Diagnostic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported	1GB PC3200 CL3 ECC DDR-SDRAM kit 2GB PC3200 CL3 ECC DDR-SDRAM kit 80GB SATA-150 7.2k HDD 160GB SATA-150 7.2k HDD 73GB 15K Ultra320 SCSI Hot-Swap HDD 146GB 15K Ultra320 SCSI Hot-Swap HDD 146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 300GB 10K Ultra320 SCSI Hot-Swap SL HDD	39M5803 39M4503 25R6903 90P1319 40K1028 40K1024 40K1025
Security	Power-on password / administrator password / Secure Power On/Off / unattended boot / selectable boot / unattended start mode / text console redirect via serial over LAN	IBM TotalStorage FC2-133 Host Bus Adaptor IBM ServeRAID-6M SCSI (256MB Cache) USB Portable Diskette Drive	24P0960 02R0988 05K9276
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others		
Cooling fans	Eight fans (five for system, three inside power supply) / Calibrated Vector Cooling™ / variable speed / not redundant / not hot-swap		
Power supply	411 watt / universal / auto-sensing / auto-restart support		
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), os		



Slot 1: full-length, 64-bit 133/100MHz PCI X 1.0 (3.3v) std. / full-length, PCI-E x8 option
 Slot 2: half-length, PCI-E x8

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

- ⇨ Stealth black color front bezel
- ⇨ Utility tray in front slides out from under middle bay (USB devices)
- ⇨ H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x 653.3mm
- ⇨ 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- ⇨ Configuration/Setup Utility: F1 at startup
- ⇨ System Partition Boot: ALT+F1 at startup
- ⇨ Network Boot: F12 at startup
- ⇨ Operator Information Panel in front
- ⇨ LSI Logic Configuration Utility: CTRL+C at startup
- ⇨ Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- ⇨ Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity¹³ (model dependent):
 600GB with two 300GB SL SCSI disks or
 320GB with two 160GB SATA disks

LIMITED WARRANTY³

1 year parts and labor
 International Warranty Service³
 On site, 8 am - 5 pm, Mon - Fri
 coverage excluding holidays,
 next business day response time⁷
 On site service upgrade options
 (in eligible locations):⁷

- 1 year IOR 9x5, 4 hr avg response (ServicePac® partnum 69P9399)
- 2 year IOR 24x7, 4 hr avg response (ServicePac partnum 96P2119)
- 2 year IOR 24x7, 2 hr avg response (ServicePac partnum 96P2120)
- 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 69P9507)
- 3 year IOR 9x5, NBD response (ServicePac partnum 69P9505)

Other ServicePac options at
www.ibm.com/services/us/its/pdf/wamomxeu.pdf
 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-GAV	Qty x Processor/Core	Speed	L2 Cache	Memory	Disk / Controller	Disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
7969 - 85y-85x	1 x Opteron®285/DC	2.6GHz ¹	2MB	2x512MB Chipkill	none/Ultra320	2 hot-swap	2x3	Dual Gigabit	1 year	Apr 2006
7969 - 86y-86x	1 x Opteron 285/DC	2.6GHz	2MB	2x512MB Chipkill	80GB/SATA	2 fixed	2x3	Dual Gigabit	1 year	Apr 2006

Positioning Processor(s)	Entry 2-way rack server for compute-intensive applications and dual core computing at an attractive price Up to 2 x AMD® Opteron™ 285 Dual Core or 254 Single Core / 800Mhz HyperTransport technology / Simultaneously supports 32-bit and 64-bit computing									
L2 cache	1MB / per core / at processor speed (no L3 cache)									
SMP support	2-way SMP / up to two Opteron Processors (same speed/cache size required)									
Implementation	Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, eight memory DIMM slots, integrated SATA or SCSI, ethernet, graphics, one PCI-E x8 and one 64-bit 133/100Mhz PCI-X (option to convert PCI-X slot to second PCI-E x8)									
Memory	1GB std / 16GB max ¹³ / four slots enabled with uni-processor, eight with dual / two slots used / six slots available / PC3200 registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Chipkill™ supported									
SCSI disk controller	All (not used on SATA models): LSI Logic® 53C1020 / Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector									
SATA controller/cable	All: SATA-150 controller / two connectors on planar / two 1-drop cables / 1 IDE									
Disk - capacity	SCSI models: some: open some: 36GB; SATA models: 80GB / 7200 rpm / 9.0ms seek									
Disk - bays	SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled, supports 15k drives									
Mechanical Architecture/chipsets	EIA 19" Rack (1U ⁴) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products ServerWorks HT2000 System I/O controller connects to the processor sub-system via a 16x Hyper Transport Bus at 1GHz and provides PCI-E, PCI-X and Dual Gigabit Ethernet / ServerWorks HT1000 South Bridge interfaces system I/O to the HT2000 via a 8x Hyper Transport bus and provides PCI-X, SATA 2.0, USB 2.0, ATA 100 IDE, SMB, IOAPIC, Event Timer, Watchdog Timer, Interrupt controller and LPC1									
Bus slots	(See detail below) one full-length PCI-X 1.0 and one half length PCI-E x8 / option to convert PCI-X slot to PCI-E x8 / no hot-swap Active™ PCI slots									
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5780 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / two rear RJ-45 ports									
Optical/diskette/kbd	24X-10X ⁶ CD-ROM / IDE / Diskette and keyboard: none (USB diskette and keyboard optional); legacy not supported									
Rear ports	Rear: two USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45) / parallel port not supported									
Front ports / graphics	Front: two USB (Vers 2.0); Graphics: SVGA / ATI® RN50b / on planar / 16MB SDRAM std/max / 1024x768x32bit@85Hz									
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported									
Systems mgmt	Standard MS-9549 QLogic system management / IPMI 1.5 compliant / connector on planar / Remote Supervisor Adapter II optional					Opteron 254 Processor Upgrade Opteron 265 Processor Upgrade Opteron 275 Processor Upgrade Opteron 285 Processor Upgrade				
Diagnostics	Diagnostic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported					1GB PC3200 CL3 ECC DDR-SDRAM kit 2GB PC3200 CL3 ECC DDR-SDRAM kit 80GB SATA-150 7.2k HDD 160GB SATA-150 7.2k HDD				
Security	Power-on password / administrator password / Secure Power On/Off / unattended boot / selectable boot / unattended start mode / text console redirect via serial over LAN					73GB 15K Ultra320 SCSI Hot-Swap HDD 146GB 15K Ultra320 SCSI Hot-Swap HDD 146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 300GB 10K Ultra320 SCSI Hot-Swap SL HDD IBM TotalStorage FC2-133 Host Bus Adapter IBM ServeRAID-6M SCSI (256MB Cache) USB Portable Diskette Drive				
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others					25R6903 90P1319 40K1028 40K1024 40K1025 24P0960 02R0988 05K9276				
Cooling fans	Eight fans (five for system, three inside power supply) / Calibrated Vector Cooling™ / variable speed / not redundant / not hot-swap									
Power supply	411 watt / universal / auto-sensing / auto-restart support									
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), os									

Slot 1: full-length, 64-bit 133/100MHz PCI X 1.0 (3.3v) std. / full-length, PCI-E x8 option
Slot 2: half-length, PCI-E x8

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

- ❖ Stealth black color front bezel
- ❖ Utility tray in front slides out from under middle bay (USB devices)
- ❖ H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x 653.3mm
- ❖ 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- ❖ Configuration/Setup Utility: F1 at startup
- ❖ System Partition Boot: ALT+F1 at startup
- ❖ Network Boot: F12 at startup
- ❖ Operator Information Panel in front
- ❖ LSI Logic Configuration Utility: CTRL+C at startup
- ❖ Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- ❖ Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity¹³ (model dependent):
600GB with two 300GB SL SCSI disks or
320GB with two 160GB SATA disks

LIMITED WARRANTY³

- ❖ 1 year parts and labor
- ❖ International Warranty Service³
- ❖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ❖ On site service upgrade options (in eligible locations):⁷
 - 1 year IOR 9x5, 4 hr avg response (ServicePac® partnum 69P9399)
 - 2 year IOR 24x7, 4 hr avg response (ServicePac partnum 96P2119)
 - 2 year IOR 24x7, 2 hr avg response (ServicePac partnum 96P2120)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 69P9507)
 - 3 year IOR 9x5, NBD response (ServicePac partnum 69P9505)
- ❖ Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf
- ❖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-GAV-model	Qty x Processor	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
8837-15y-15x	1 x Xeon® 3.0GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-1Vy-1Vx	1 x Xeon 3.0GHz	2MB	1GB	None (open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Mar 2005
8837-16y-16x	1 x Xeon 3.0GHz	2MB	1GB	None (open 3.5)	SATA	DVD	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Mar 2005
8837-25y-25x	1 x Xeon 3.2GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-35y-35x	1 x Xeon 3.4GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-3Vy-3Vx	1 x Xeon 3.4GHz	2MB	1GB	None (open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Mar 2005
8837-36y-36x	1 x Xeon 3.4GHz	2MB	1GB	None (open 3.5)	SATA	DVD	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Mar 2005
8837-45y-45x	1 x Xeon 3.6GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-E1y-E1x	1 x Xeon 3.0GHz	2MB	2GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-E2y-E2x	1 x Xeon 3.0GHz	2MB	2GB	None (open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Mar 2005

Positioning Processor(s) Cache SMP support Implementation
A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments
1 x Intel® Xeon 3.0, 3.2, 3.4, 3.6GHz with 800MHz / 2MB L2 Cache / Extended Memory 64 Technology (EM64T)
2MB L2 cache on all models / on die of processor / at processor speed / ECC
2-way SMP / up to two Xeon Processors (same speed/cache size)
 Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, eight DIMM slots, two PCI-X slots (one full length 133MHz, one low-profile 100MHz) and integrated SCSI or SATA, dual GB ethernet, graphics

Memory **1GB** std / 16GB max¹³ / 8 slots (6 avail) / **PC2-3200** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Active Memory™**: online spare and memory mirror / **Error Checking and Correcting (ECC)**

SCSI disk controller **LSI Logic® 53C1020 / Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / no external connector
 SATA disk Controller Enhanced SATA-150 (150MB/sec) controller / two connectors on planar / two one-drop cables
 IDE controller / cable Disk - MAX capacity one 1-drop EIDE cable to DVD-ROM
SCSI 3.5: 292GB with two 146GB HDD **SCSI 2.5:** four 2.5" 73GB HDD **SATA:** 500GB with two 250GB HDD
SCSI: two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors **SATA:** 2 simple-swap

Mechanical Architecture / chipsets **EIA 19" Rack (1U⁴)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Intel E7520 / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)

Bus slots Ethernet controllers (See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail
 Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports
Some: DVD-ROM / IDE; *Diskette:* none
 Rear ports **Rear:** Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2
 Graphics SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt **IBM Baseboard Management Controller (BMC)** / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr req)

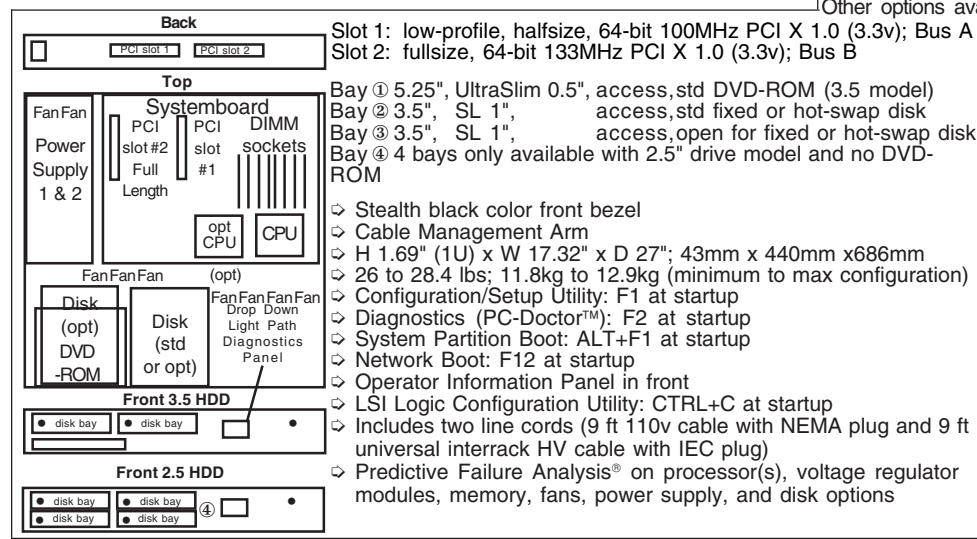
Diagnostics **Drop down light path diagnostics** Pull out Front panel (LED lights indicate failing component)

Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Software **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others

Xeon 3.2GHz/2MB L2 Proc Upg	25R8905
Xeon 3.6GHz/2MB L2 Proc Upg	13N0667
512MB (2x256)PC2-3200 CL3 ECC DDR2 RDIMM	73P3523
1GB (2x512)PC2-3200 CL3 ECC DDR2 ChipKill	73P2865
2GB (2x1GB)PC2-3200 CL3 ECC DDR2 ChipKill	73P2866
80GB SATA 7.2K Simple Swap HDD	73P8002
160GB SATA 7.2K Simple Swap HDD	73P8003
73GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
36.4GB 10K Ultra320 SCSI Hot-Swap 2.5" HDD	32P0796
ServeRAID 6i+ adaptor	13N2190
Remote Supervisor Adapter II slimline	73P9341
Second 585W Power supply	90P5280
PCI-Express x8 full-length riser card	22R9293
Other options available at www.ibm.com/pc/us/accessories	

Cooling fans seven-nine fans / variable speed / hot-swap / redundant
 Power supply 585 watt hot-swap (second Opt)/ universal / auto sensing / auto re-start
 Prerequisites Monitor, keyboard, mouse, rack, disk (some), operating sys



LIMITED WARRANTY³

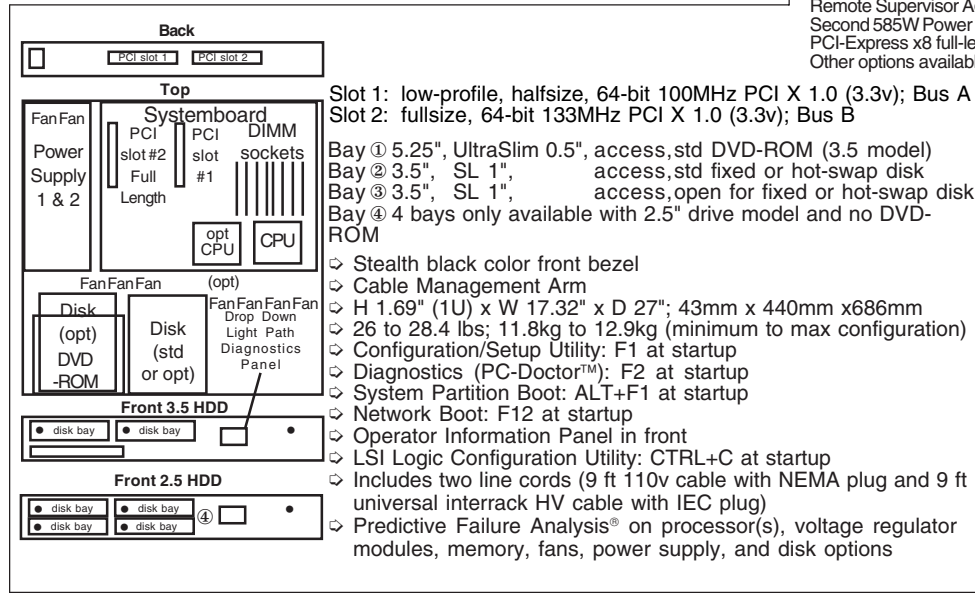
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
 - 5 year IOR 9x5, NBD response (ServicePac part num 69P9246)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
8837-05U-05x	1 x Xeon™ 2.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-0WU-0Wx	1 x Xeon 2.8GHz/SC	2MB	1GB	None(open 2.5)	Ultra320	None	585W	4 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-06U-06x	1 x Xeon 2.8GHz/SC	2MB	1GB	None(open 3.5)	SATA	DVD	585W	2 simple-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-55U-55x	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-5VU-5Vx	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 2.5)	Ultra320	None	585W	4 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-56U-56x	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 3.5)	SATA	DVD	585W	2 simple-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-E4U-E4x	1 x Xeon 2.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-E5U-E5x	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	2x585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-D1U-D1x	1 x Xeon 2.8GHz/DC	2x2MB	2GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Nov 2005
8837-DAU-DAx	1 x Xeon 2.8GHz/DC	2x2MB	2GB	None(open 2.5)	Ultra320	DVD	585W	4 hot-swap	2x3	2 x Gigabit	3 year	Nov 2005
8837-1RU-1Rx	1 x Xeon 3.0GHz/SC	2MB	1GB	None(open 2.5)	Ultra320	DVD	585W	4 hot-swap	2x3	2 x Gigabit	3 year	April 2006

Positioning Processor(s)	A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments Intel® Xeon Processor up to 3.8GHz Single Core 800MHz FSB / Xeon Processor 2.8GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T) / Hyper-Threading	
Cache	2MB L2 Cache std on Single Core / 2x2MB L2 Cache std on Dual Core / on die of processor / at processor speed / ECC	
SMP support Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, eight DIMM slots, two PCI-X slots (one full length 133MHz, one low-profile 100MHz) and integrated SCSI or SATA, dual GB ethernet, graphics	
Memory	1GB std / 16GB max ¹³ / 8 slots (6 avail) / PC2-3200 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Active Memory™ : online spare and memory mirror / Error Checking and Correcting (ECC)	
SCSI disk controller	LSI Logic® 53C1020 / Ultra320 SCSI controller (LVD 320MB/sec) / on planar / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / no external connector	
SATA disk Controller	Enhanced SATA-150 (150MB/sec) controller / two connectors on planar / two one-drop cables	
IDE controller / cable	one 1-drop EIDE cable to DVD-ROM	
Disk - MAX capacity	SCSI 3.5 : 292GB with two 146GB HDD SCSI 2.5 : four 2.5" 73GB HDD SATA : 500GB with two 250GB HDD	
Disk - bays	SCSI : two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors SATA : 2 simple-swap	
Mechanical Architecture / chipsets	EIA 19" Rack (1U⁴) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products Intel E7520 / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)	
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail	
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports	
DVD-ROM / diskette	Some : DVD-ROM / IDE; Diskette : none	
Rear ports	Rear : Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2	
Graphics	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus	
Systems mgmt	IBM Baseboard Management Controller (BMC) / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr req)	
Diagnostics	Drop down light path diagnostics Pull out Front panel (LED lights indicate failing component)	
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others	
Cooling fans	Calibrated Vectored Cooling™ / Std: seven fans; Max: nine / variable speed / hot-swap / redundant	
Power supply	585 watt hot-swap (second Opt)/ universal / auto sensing / auto re-start	
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys	

Xeon 2.8GHz SC 2MB L2 Proc Upg	40K2509
Xeon 2.8GHz DC 4MB L2 Proc Upg	40K2501
Xeon 3.0GHz SC 2MB L2 Proc Upg	40K2510
Xeon 3.2GHz SC 2MB L2 Proc Upg	40K2511
Xeon 3.4GHz SC 2MB L2 Proc Upg	40K2512
Xeon 3.6GHz SC 2MB L2 Proc Upg	40K2513
Xeon 3.8GHz SC 2MB L2 Proc Upg	40K2514
512MB (2x256)PC2-3200 CL3 ECC DDR2 RDIMM	73P3523
1GB (2x512)PC2-3200 CL3 ECC DDR2 ChipKill	39M5821
(2x1GB)PC2-3200 CL3 ECC DDR2 ChipKill	39M5809
80GB SATA 7.2K Simple Swap HDD	73P8002
160GB SATA 7.2K Simple Swap HDD	73P8003
73GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
36.4GB 10K Ultra320 SCSI Hot-Swap 2.5" HDD	32P0796
ServeRAID 6i+ adaptor	13N2190
Remote Supervisor Adapter II slimline	73P9341
Second 585W Power supply	90P5280
PCI-Express x8 full-length riser card	22R9293

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



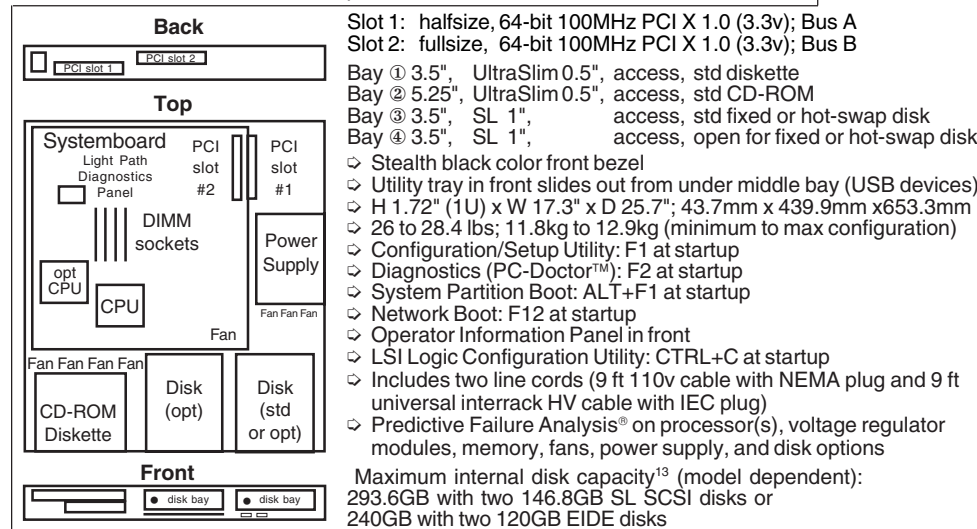
LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
 - 5 year IOR 9x5, NBD response (ServicePac part num 69P9246)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Hot-swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
8676-1AX	1 x Xeon 2.8B GHz	512KB	533	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	3 year	Mar 2003

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

Positioning	<i>A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments</i>																																									
Processor(s)	1 x Intel® Xeon 2.8BGHz¹ with 533MHz frontside bus / Hyper-Threading technology																																									
L2 cache	512KB / on die of processor / at processor speed (no L3 cache)																																									
SMP support	2-way SMP / up to two Xeon Processors (same speed/cache size)																																									
Implementation	Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated SCSI, ethernet, graphics																																									
Memory	512MB std / 8GB max ¹³ / two slots used / two slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)																																									
SCSI disk controller	<i>All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller</i> (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector																																									
IDE controller / cable	<i>All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM</i>																																									
Disk - capacity	<i>SCSI models: none standard / supports up to 15000 rpm disks; EIDE models: 40GB / 7200 rpm / ATA-100 / 8.7ms seek</i>																																									
Disk - bays	<i>SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled</i>																																									
Mechanical Architecture / chipsets	EIA 19" Rack (1U⁴) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge for PCI-X Bus A with slot 1 and dual ethernet and PCI-X Bus B with slot 2 and Ultra320 / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2 Bus C with graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National Semiconductor® PC87417 Super I/O chip																																									
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots																																									
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus A / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports																																									
CD-ROM / diskette	24X-10X ⁶ CD-ROM / IDE; <i>Diskette: 3.5" 1.44MB diskette drive / dust cover</i>																																									
Rear ports	<i>Rear: one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port</i>																																									
Front ports / graphics	<i>Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus</i>																																									
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)																																									
Systems mgmt	IBM Integrated system management processor (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter with 20-pin conn on planar for continuous pwr (no ext pwr req)																																									
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																																									
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																																									
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others																																									
Cooling fans	Eight fans (five for system, three on power supply) / variable speed / not redundant or hot-swap																																									
Power supply	332 watt (-48 to -60 V dc [direct current]) / auto-sensing / supports dual input sources (two power sources) / not redundant / not hot-swap / auto-restart support																																									
Prerequisites	Monitor, keyb., mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5																																									
	<table border="1"> <thead> <tr> <th colspan="3">OPTIONS</th> </tr> </thead> <tbody> <tr> <td>Xeon 2.8BGHz/512KB L2 Cache Proc Upg</td> <td></td> <td>73P6382</td> </tr> <tr> <td>512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM</td> <td></td> <td>33L5038</td> </tr> <tr> <td>1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td></td> <td>33L5039</td> </tr> <tr> <td>2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td></td> <td>33L5040</td> </tr> <tr> <td>36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD</td> <td></td> <td>06P5776</td> </tr> <tr> <td>Remote Supervisor Adapter</td> <td></td> <td>09N7585</td> </tr> <tr> <td>ServeRAID™-4Mx Ultra160 SCSI Adapter</td> <td></td> <td>06P5736</td> </tr> <tr> <td>Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)</td> <td></td> <td>06P4792</td> </tr> <tr> <td>NetBAY ACT Local Console Manager</td> <td></td> <td>1735L04</td> </tr> </tbody> </table>												OPTIONS			Xeon 2.8BGHz/512KB L2 Cache Proc Upg		73P6382	512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM		33L5038	1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM		33L5039	2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM		33L5040	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD		06P5776	Remote Supervisor Adapter		09N7585	ServeRAID™-4Mx Ultra160 SCSI Adapter		06P5736	Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)		06P4792	NetBAY ACT Local Console Manager		1735L04
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LIMITED WARRANTY ³	
↻	3 year parts and labor
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↻	On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
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•	3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
•	3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
•	3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
•	4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
•	5 year IOR 9x5, NBD response (ServicePac part num 69P9246)
↻	Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf
↻	24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

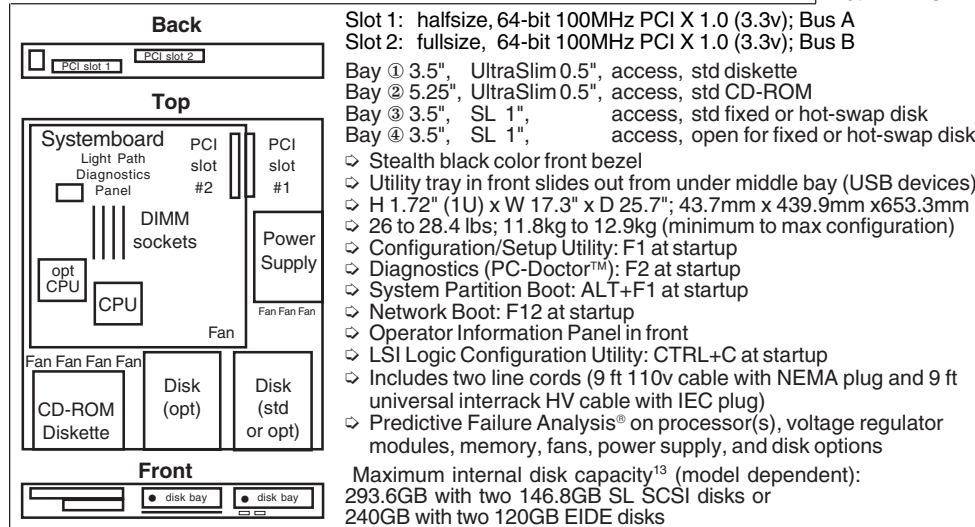
• = Hot-swap

® US models announced February 18, 2003

IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Hot-swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty ³	Available date
8676-LAX	1 x Xeon 2.8B GHz	512KB	533	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	3 year	Jan 2004

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

Positioning	<i>A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments</i>																																												
Processor(s)	1 x Intel® Xeon 2.8BGHz¹ with 533MHz frontside bus / Hyper-Threading technology																																												
L2 cache	512KB / on die of processor / at processor speed (no L3 cache)																																												
SMP support	2-way SMP / up to two Xeon Processors (same speed/cache size)																																												
Implementation	Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated SCSI, ethernet, graphics																																												
Memory	512MB std / 8GB max ¹³ / two slots used / two slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips). Chipkill available on DIMMs of 512MB or greater only.																																												
SCSI disk controller	<i>All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector</i>																																												
IDE controller / cable	<i>All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM</i>																																												
Disk - capacity	<i>SCSI models: none standard / supports up to 15000 rpm disks; EIDE models: 40GB / 7200 rpm / ATA-100 / 8.7ms seek</i>																																												
Disk - bays	<i>SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled</i>																																												
Mechanical Architecture / chipsets	EIA 19" Rack (1U⁴) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge for PCI-X Bus A with slot 1 and dual ethernet and PCI-X Bus B with slot 2 and Ultra320 / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2 Bus C with graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National Semiconductor® PC87417 Super I/O chip																																												
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots																																												
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus A / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports																																												
CD-ROM / diskette	24X-10X ⁶ CD-ROM / IDE; <i>Diskette: 3.5" 1.44MB diskette drive / dust cover</i>																																												
Rear ports	<i>Rear: one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port</i>																																												
Front ports / graphics	<i>Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus</i>																																												
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)																																												
Systems mgmt	IBM Integrated system management processor (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter with 20-pin conn on planar for continuous pwr (no ext pwr req)																																												
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																																												
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																																												
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others																																												
Cooling fans	Eight fans (five for system, three on power supply) / variable speed / not redundant or hot-swap																																												
Power supply	332 watt (-48 to -60 V dc [direct current]) / auto-sensing / supports dual input sources (two power sources) / not redundant / not hot-swap / auto-restart support																																												
Prerequisites	Monitor, keyb., mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5																																												
	<table border="0"> <thead> <tr> <th></th> <th colspan="2">OPTIONS</th> </tr> </thead> <tbody> <tr> <td>Xeon 2.8BGHz/512KB L2 Cache Proc Upg</td> <td></td> <td>73P6382</td> </tr> <tr> <td>2x256MB PC2100 CL2.5 non-Chipkill DIMM</td> <td></td> <td>73P2868</td> </tr> <tr> <td>512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM</td> <td></td> <td>33L5038</td> </tr> <tr> <td>1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td></td> <td>33L5039</td> </tr> <tr> <td>2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td></td> <td>33L5040</td> </tr> <tr> <td>36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD</td> <td></td> <td>06P5776</td> </tr> <tr> <td>Remote Supervisor Adapter</td> <td></td> <td>09N7585</td> </tr> <tr> <td>ServeRAID™-4Mx Ultra160 SCSI Adapter</td> <td></td> <td>06P5736</td> </tr> <tr> <td>Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)</td> <td></td> <td>06P4792</td> </tr> <tr> <td>NetBAY ACT Local Console Manager</td> <td></td> <td>1735L04</td> </tr> </tbody> </table>													OPTIONS		Xeon 2.8BGHz/512KB L2 Cache Proc Upg		73P6382	2x256MB PC2100 CL2.5 non-Chipkill DIMM		73P2868	512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM		33L5038	1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM		33L5039	2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM		33L5040	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD		06P5776	Remote Supervisor Adapter		09N7585	ServeRAID™-4Mx Ultra160 SCSI Adapter		06P5736	Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)		06P4792	NetBAY ACT Local Console Manager		1735L04
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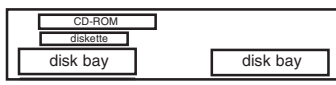
LIMITED WARRANTY ³	
↻	3 year parts and labor
↻	International Warranty Service³
↻	On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
↻	On site service upgrade options (in eligible locations):⁷
•	3 year IOR 9x5, 4 hr avg response (ServicePac® part num 21P2072)
•	3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2073)
•	3 year IOR 24x7, 2 hr avg response (ServicePac part num 21P2074)
•	4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9244)
•	5 year IOR 9x5, NBD response (ServicePac part num 69P9246)
↻	Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf
↻	24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

• = Hot-swap

US models announced January 20, 2004

IBM® Type-model	Qty x Processor	L2 cache	Memory	Ultra160 SCSI disk	SCSI controller	Mechanical	Slots x bays	Fixed disk bays	Alarm Panel	Power supply	Compliant	Available date
8827-14X	2 x Pentium® III 1.26GHz	512KB	2GB	1 x 36.4GB ² 10K	2 x Ultra160	2U ⁴ rack	6x4	2 fixed	Yes	DC power	NEBS-3	Apr 2002
<p>DC power models are designed for network infrastructures requiring network equipment to support DC power environments</p>												
Positioning	Network Equipment Building System (NEBS) level 3-compliant for telecommunications carrier-grade environments											
Processor(s)	2 x Intel® Pentium® III 1.26GHz-S with 133MHz frontside bus											
L2 cache	512KB std and max / ECC / at processor speed / processor and L2 cache in Flip Chip Pin Grid Array (FC-PGA2)											
Implementation	Motherboard contains two Intel PGA370 sockets, six DIMM sockets, two PCI riser connectors, and integrated subsystems											
SMP support	2-way SMP via second identical processor is standard											
Memory	2GB std / 6GB ¹³ max / 6 sockets / 4 available (ships with two 1GB DIMMs) / Error Checking and Correcting (ECC) memory controller / matched pairs required / two-way interleaving / SDRAM / 133MHz / six 168-pin gold-plated sockets / PC133-compliant / supports registered SDRAM ECC DIMMs only											
SCSI disk controller	Adaptec® AHA-7899W / dual channel Wide Ultra160 SCSI controller (LVD 160MB/sec) / on planar / 64-bit PCI											
SCSI channels	SCSI Channel A: external 16-bit .8mm VHDCI 68-pin external connector (no cables) SCSI Channel B: one internal 16-bit 68-pin LVD cable from controller to two-bay disk drive carrier											
SCSI disk	1 x 36GB Ultra160 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T. ⁵											
SCSI disk bays	Two fixed disk bays (not hot-swap) in disk drive carrier that slides out from front											
IDE controller / cable	EIDE ATA-33 controller in South Bridge / one connector on planar / one 1-drop IDE cable (to CD-ROM)											
Mechanical	EIA 19" Rack (2U ⁴) x 20-inch deep											
Rack support	Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit											
PCI bus slots	(See below) three full height full length 64-bit 33MHz slots / three low-profile half length 64-bit 66MHz PCI slots / PCI 2.2 / peer PCI buses / no hot-swap Active™ PCI slots											
Chipset	ServerWorks® III HE-SL chipset / CNB20HE-SL North Bridge for CIOB and PCI A 32-bit 33MHz (graphics, ethernet, South Bridge) / NB6555 Champion I/O Bridge (CIOB20) for PCI Bus B (slots, SCSI) and C (slots) / CSB5 South Bridge for EIDE, USB, LPC bus for Super I/O National Semiconductor PC8741 (diskette, serial, keyboard) and Baseboard Management Controller											
Bays	(See diagram below): 4 bays / two disk bays (not hot-swap) / one CD-ROM bay / one diskette bay											
10/100 ethernet	2 x Intel 82550 / on planar / full duplex / supports Wake on LAN®, PXE 2.0 Boot Agent, Adapter Fault Tolerance Failover											
CD-ROM / diskette	24X-10X ⁶ CD-ROM / multisession / IDE interface / bootable; Diskette: 3.5" 1.44MB diskette drive / dust cover											
Rear ports	Two USB ports (Version 1.1); RJ-45 serial; PS/2 keyboard; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port / mouse connects to USB port (or keyboard port with standard Y-splitter cable)											
Graphics controller	SVGA / PCI bus / ATI® Rage XL (on planar) / 8MB SDRAM std/max / 1600x1280 at 16M colors at 85Hz / 15-pin D-shell											
Security	Power-on password / admin password / unattended boot / selectable boot / boot without keyboard / diskette write protect											
Alarm panel	External alarm panel in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault											
Status LEDs	Operator Information Panel (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)											
Systems mgmt	Integrated service processor (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /											
Diagnostics	LED diagnostics and on-board diagnostics providing an LED map to a failing component											
OS support	Red Hat Linux® 7.1											
Software ship group	Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide), PC-Doctor™ diagnostics diskette, and IBM Director (on separate CD)											
Keyboard / mouse	None (since rack-based)				512MB SDRAM ECC DIMM 133MHz RDIMM				33L3324			
Power supply	Std: two; max: two / accessible from rear / 350 watt (-48 to -60 V dc [direct current]) / supports dual input sources (two power sources) / redundant / hot-swap / auto-restart support				1GB SDRAM ECC DIMM 133MHz RDIMM				33L3326			
Fans	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each Pentium III processor				36.4GB 10K Ultra160 SCSI SL HDD				06P5751			
Prerequisites	Appropriate dc power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system				IBM E54 (13.8" viewable) FST Monitor (black)				633147N			
					IBM Sleek Two-Button Mouse (black)				28L3673			
					IBM 84-key Space Saver Keyboard (black)				28L3644			
					Other options at ibm.com/pc/us/accessories							

<p>Slot 1: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B</p> <p>Slot 2: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B</p> <p>Slot 3: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B</p> <p>Slot 4: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C</p> <p>Slot 5: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C</p> <p>Slot 6: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C</p>	<p>➤ Raven black color (front bezel)</p> <p>➤ Configuration/Setup Utility invoked by pressing F2 at startup</p> <p>➤ SCSISelect near startup by pressing CTRL+A</p> <p>➤ PC-Doctor™ diagnostics on diskette</p> <p>➤ Several hardcopy publications</p> <p>➤ H 3.5" x W 17.5" x D 20.0"</p> <p>➤ H 89 mm x W 445 mm x D 508 mm</p> <p>➤ 34 to 37 pounds (15.4 to 16.8 kg)</p> <p>➤ IPMI 1.5 and WfM 2.0-compliant</p>	<p>LIMITED WARRANTY³</p> <p>↔ 1 year parts and labor</p> <p>↔ International Warranty Service³</p> <p>↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷</p> <p>↔ 1 year on site warranty service upgrade options (in eligible locations):⁷</p> <ul style="list-style-type: none"> • 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (No ServicePac® part number) • 24 hr x 7 day coverage, 4 hour average response time (No ServicePac part number) • 24 hr x 7 day coverage, 2 hour average response time (No ServicePac part number) <p>↔ 24x7¹⁴ toll-free support for warranty issues during the warranty period³</p>
<p>2U Rack</p>  <p>Bay ① 3.5", 0.5", access, std diskette</p> <p>Bay ② 3.5", 0.5", access, std CD-ROM</p> <p>Bay ③ 3.5", SL 1", no access, std disk</p> <p>Bay ④ 3.5", SL 1", no access, optional disk</p>		
<p>All models: Max int disk capacity: 72.8GB² with two 36.4GB SL disks</p>		

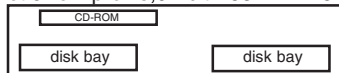
See footnotes for important warranty information
US model announced March 19, 2002

IBM® Type-model	Qty x Processor	L2 cache Memory	Ultra320 SCSI disk	SCSI controller	Mechanical	Slots x Disk bays	Alarm Panel	Power supply	Compliant	Available date
8847-14X	2 x Pentium® Xeon 2.4GHz	512KB 1GB	1 x 73.4GB ² 10K	2 x Ultra320	2U ⁴ rack	6x3 2 HS	Yes	DC power	NEBS-3	Jul 2004
8847-24X	2 x Pentium Xeon 2.4GHz	512KB 2GB	1 x 146.8GB 10K	2 x Ultra320	2U rack	6x3 2 HS	Yes	DC power	NEBS-3	Jul 2004

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

Positioning	<i>Network Equipment Building System (NEBS) level 3-compliant for telecommunications carrier-grade environments</i>									
Processor(s)	2 x Intel® Pentium® Xeon 2.4GHz with 533MHz frontside bus									
L2 cache	512KB std and max / ECC / at processor speed / processor and L2 cache in Flip Chip Pin Grid Array (FC-PGA2)									
Implementation	Motherboard contains two Intel Socket 604 INT3/FCPGA, six DIMM sockets, two PCI riser connectors, and integrated SMP support									
SMP support	subsystems 2-way SMP via second identical processor is standard									
Memory	Up to 2GB std / 12GB¹³ max / 266MHz SDRAM / Six 168-pin sockets / Two sockets used / Four sockets available / ships with two 512 GB or 1GB DIMMs / Error Checking and Correcting (ECC) memory controller / matched pairs required / two-way interleaving / optional 2GB upgrade kit available by special bid									
SCSI disk controller	Adaptec® AIC-7902W / dual channel Wide Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit PCI									
SCSI channels	SCSI Channel A: external 16-bit .8mm VHDCI 68-pin external connector (no cables) SCSI Channel B: one internal 16-bit 68-pin LVD cable from controller to two-bay disk drive carrier									
SCSI disk	1 x 73.4GB or 146.8GB Ultra320 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T. ⁵									
SCSI disk bays	Two fixed disk bays (not hot-swap) in disk drive carrier that slides out from front									
IDE controller / cable	EIDE ATA-66 controller in South Bridge / one connector on planar / one 1-drop IDE cable (to CD-ROM)									
Mechanical	EIA 19" Rack (2U⁴) x 20-inch deep									
Rack support	Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit									
PCI bus slots	(See below) three full height full length 64-bit 133MHz slots / three low-profile half length 64-bit 66MHz PCI slots / PCI 2.2 / peer PCI buses / no hot-swap Active™ PCI slots									
Chipset	Intel® E7501 chipset / E7501 MCH North Bridge for CIOB and PCI A 64-bit 33MHz (graphics, ethernet, South Bridge) / P64Hz PCI Bus B (slots, SCSI) and C (slots) / ICH3-S South Bridge for EIDE, USB, LPC bus for Super I/O National Semiconductor PC87417 (serial, keyboard) and Baseboard Management Controller									
Bays	(See diagram below): 3 bays / two disk bays (hot-swap) / one CD-ROM bay									
10/100 ethernet	2 x Intel 82546 / on planar / full duplex / supports Wake on LAN®, PXE 2.0 Boot Agent, Adapter Fault Tolerance Failover									
CD-ROM / diskette	24X-10X ⁶ CD-ROM / multisession / IDE interface / bootable									
Rear ports	Two USB ports (Version 1.1); RJ-45 serial; PS/2 keyboard; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port / mouse connects to USB port (or keyboard port with standard Y-splitter cable)									
Graphics controller	SVGA / PCI bus / ATI® Rage XL (on planar) / 8MB SDRAM std/max / 1600x1280 at 16M colors at 85Hz / 15-pin D-shell									
Security	Power-on password / admin password / unattended boot / selectable boot / boot without keyboard									
Alarm panel	External alarm panel in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault									
Status LEDs	Operator Information Panel (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)									
Systems mgmt	Integrated service processor (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /									
Diagnostics	LED diagnostics and on-board diagnostics providing an LED map to a failing component									
OS support	Microsoft Windows 2000, Windows 2003 Advanced Server / Red Hat AS 2.1 / SLES									
Software ship group	Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide)									
Keyboard / mouse	None (since rack-based)					2GB PC2100 DDR ECC RDIMM Memory Kit 73P4126				
Power supply	Std: one (14X) or two (24X); max: two / accessible from rear					Other options available via special Bid				
Fans	480 watt (-48 to -60 V dc [direct current]) / supports dual input sources (two power sources) / redundant / hot-swap / auto-restart support									
Prerequisites	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each Pentium III processor Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system									

- Slot 1: fullsize, 64-bit 64MHz PCI-X (5v), Bus B
- Slot 2: fullsize, 64-bit 64MHz PCI-X (5v), Bus B
- Slot 3: fullsize, 64-bit 64MHz PCI-X (5v), Bus B
- Slot 4: low-profile, 64-bit 133MHz PCI-X (3.3v), Bus C
- Slot 5: low-profile, 64-bit 133MHz PCI-X (3.3v), Bus C
- Slot 6: low-profile, 64-bit 133MHz PCI-X (3.3v), Bus C



2U Rack

- Bay ② 3.5", 0.5", access, std CD-ROM
- Bay ③ 3.5", SL 1", no access, std disk
- Bay ④ 3.5", SL 1", no access, optional disk

- ⇨ Raven black color (front bezel)
- ⇨ Configuration/Setup Utility invoked by pressing F2 at startup
- ⇨ SCSISelect near startup by pressing CTRL+A
- ⇨ PC-Doctor™ diagnostics on diskette
- ⇨ Several hardcopy publications
- ⇨ H 3.45" x W 17.14" x D 20.0"
- ⇨ H 87.6 mm x W 435.3 mm x D 508 mm
- ⇨ 34 to 37 pounds (15.4 to 16.8 kg)

LIMITED WARRANTY³

- ⇨ 3/3 year parts and labor
- ⇨ International Warranty Service³
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇨ 2 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time 96P2122
 - 24 hr x 7 day coverage, 4 hour average response time 96P2123
 - 24 hr x 7 day coverage, 2 hour average response time 96P2124
- ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

All models: Max int disk capacity: 293.6GB² with two 146.8GB SL disks

See footnotes for important warranty information

US model announced June 15, 2004

⇨ Model withdrawn from marketing effective April 2005

IBM® Type-GAV-model	Qty x Processor	L2 Cache Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-15y-15U	1 x Xeon™ 3.0GHz	2MB 1GB	None	2 x Ultra320	2U ⁴	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-16y-16U	1 x Xeon 3.0GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-25y-25U	1 x Xeon 3.2GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-35y-35U	1 x Xeon 3.4GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-36y-36U	1 x Xeon 3.4GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-45y-45U	1 x Xeon 3.6GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-E1y-E1U	1 x Xeon 3.0GHz	2MB 1GB	3x73.4GB	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
Positioning Processor	A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments 1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6GHz with 800MHz frontside bus / Optimized for Extended Memory 64 Technology (EM64T) / Hyper-Threading technology / Simultaneous multi-threaded (SMT)								
L2 cache	2MB L2 Cache / on die of processor / at processor speed								
SMP support Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel PGA604 micro-PGA ZIF sockets, eight memory DIMM slots, two low-profile PCI-X (100MHz) slots, two full-length PCI-X (133MHz) slots, and integrated SCSI, dual GB ethernet, graphics								
Memory	1GB std / 16GB¹³ max / two slots used / six slots available / DIMMs / PC2-3200 DDR2 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Active Memory™ : Memory mirroring, hot-spare memory / Error Checking and Correcting (ECC) / optional 16-bit Checksum Chipkill™ corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips,								
SCSI disk controller	Adaptec® AIC-7902 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-0 and 1 with up to one hot-spare disk / optional IBM ServeRAID™-7k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)								
SCSI channels	Two 16-bit channels (one internal and one external) / <i>SCSI Channel B</i> : 16-bit 68-pin LVD cable from systemboard to backplane for six disks; <i>Channel A</i> : 16-bit 68-pin interface to support external SCSI devices via external SCSI 0.8mm VHDCI connector / supports optional ServeRAID adapters with external connector(s) for external devices								
IDE controller/cable	Enhanced IDE ATA-100 controller in ICH5 South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)								
Disk - capacity	None standard / supports 7200-15000 rpm disks / one backplane								
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / filler panels installed in each disk bay / all disk bays Ultra320-enabled								
Mechanical Chipset	EIA 19" Rack (2U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel E7520 / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Processor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O								
Bus slots	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots								
Ethernet controller	Two gigabit 10/100/1000 ethernet ports / Two Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear								
Optical / diskette	8X-24X⁶ DVD-ROM / IDE; <i>Diskette</i> : 3.5" 1.44MB diskette drive / dust cover								
Front & Rear ports	<i>Front</i> : one USB (Vers 2.0) <i>Rear</i> : two USB (Vers 2.0), keyboard, mouse, serial (9-pin), graphics (DB-15), two ethernet (RJ-45), two RJ-45 (sys mgmt) / no parallel port								
Graphics	SVGA / ATI® Radeon™ 7000m / on planar / 16MB DDR SDRAM std/max / 32-bit 33MHz PCI 2.2 bus								
Security	Power-on password / administrator password / unattended boot / selectable boot sequence								
Systems mgmt	IBM Baseboard Management Controller (BMC) / H8S2168 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter II slimline with reserved connector for continuous power (no ext power reqd)								25R8908 25R8902 25R8903 13N0686 13N0687 13N0689
Diagnostics	Drop down light path diagnostics panel providing LED map to failing part (located on front panel)								512MB(2x256)PC2-3200CL3ECCDDR2Non-Chpk Kit 1GB(2x512)PC2-3200CL3ECCDDR2Non-Chpk Kit
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others								73P3522 73P3266 71P8642 73P9341
Keyboard / mouse	None standard (because rack-based)								IBM Remote Supervisor Adapter II Slim
Power supply	<i>Std/Max</i> : one/two 625 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing								73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD 625W (N. America) Hot-Swap Power Supply
Fans	Calibrated Vectored Cooling™ <i>Std</i> : six fans; <i>Max</i> : twelve (six fans with optional second power supply) / redundant with twelve fans installed; <i>All</i> : variable speed / hot-swap / PFA								NetBAY Local Console Manager NetBAY Remote Console Manager Other options at ibm.com/pc/us/accessories
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack								
Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A		Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X non hot, Bus A		Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*		Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*		*slots 3 & 4 riser may be replaced with PCI-Express riser	
• Opt disk		• Opt disk		• Opt disk		• Opt disk		Drop Down light path panel	
• Opt disk		• Opt disk		• Opt disk		• Opt disk		① diskette	
• Opt disk		• Opt disk		• Opt disk		• Opt disk		② DVD-ROM	
Bay ① 3.5", 0.5"		access, slim diskette		Bay ② 5.25", 0.5"		access, slim DVD-ROM		2U Rack	
Bay ③ 3.5", SL 1"		access, hot-swap, open for disk		Bay ④ 3.5", SL 1"		access, hot-swap, open for disk		Quick release adapter slots (no screws)	
Bay ⑤ 3.5", SL 1"		access, hot-swap, open for disk		Bay ⑥ 3.5", SL 1"		access, hot-swap, open for disk		Configuration/Setup Utility: F1 at startup	
Bay ⑦ 3.5", SL 1"		access, hot-swap, open for disk		Bay ⑧ 3.5", SL 1"		access, hot-swap, open for disk		Diagnostics (PC-Doctor™): F2 at startup	
Bays 3 through 8 support six SL disks; or 1 DDS5 Tape drive (2 slots used, additional PCI SCSI adaptor req)		via SCA-2 connectors		Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)		Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)		System Partition Boot: ALT+F1 at startup	
				46.5 to 62 pounds		Stealth black color		Network Boot: F12 at startup	
				All models: Max int disk capacity: 880.0GB ² with six 146.8GB SL disks				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	

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 time⁷
- 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 <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

• = Hot-swap

IBM® Type-GAV-model	Qty x Processor/Core	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-05y-05U	1 x Xeon™ 2.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U ⁴	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-E3y-E3U	1 x Xeon 2.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-E4y-E4U	1 x Xeon 3.4GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-55y-55U	1 x Xeon 3.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-D1y-D1U	1 x Xeon 2.8GHz/DC	2x2MB	2GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Oct 2005
8840-1Ry-1RU	1 x Xeon 3.0GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Apr 2006
Positioning	A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments									
Processor	Intel® Xeon™ Processor up to 3.8GHz Single Core 800MHz FSB / Xeon Processor 2.8GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T) / Hyper-Threading / Simultaneous multi-threaded									
L2 cache	2MB L2 Cache std on Single Core / 2x2MB L2 Cache std on Dual Core / on die of processor / at processor speed									
SMP support	2-way SMP / up to two Xeon Processors (same speed/cache size)									
Implementation	Systemboard contains two Intel PGA604 micro-PGA ZIF sockets, eight memory DIMM slots, two low-profile PCI-X (100MHz) slots, two full-length PCI-X (133MHz) slots, and integrated SCSI, dual GB ethernet, graphics									
Memory	1GB or 2GB std / 16GB ¹³ max / two slots used / six slots available / DIMMs / PC2-3200 DDR2 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Active Memory™; Memory mirroring, hot-spare memory / Error Checking and Correcting (ECC) / optional 16-bit Checksum Chipkill™ corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips.									
SCSI disk controller	Adaptec® RAID-7902 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-0 and 1 with up to one hot-spare disk / optional IBM ServeRAID™-7k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)									
SCSI channels	Two 16-bit channels (one internal and one external) / SCSI Channel B: 16-bit 68-pin LVD cable from systemboard to backplane for six disks; Channel A: 16-bit 68-pin interface to support external SCSI devices via external SCSI 0.8mm VHDCI connector / supports optional ServeRAID adapters with external connector(s) for external devices									
IDE controller/cable	Enhanced IDE ATA-100 controller in ICH5 South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)									
Disk - capacity	None standard / supports 7200-15000 rpm disks / one backplane									
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / filler panels installed in each disk bay / all disk bays Ultra320-enabled									
Mechanical	EIA 19" Rack (2U ⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion									
Chipset	Intel E7520 / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Processor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O									
Bus slots	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots									
Ethernet controller	Two gigabit 10/100/1000 ethernet ports / Two Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear									
Optical / diskette	8X-24X ⁶ DVD-ROM / IDE; Diskette: 3.5" 1.44MB diskette drive / dust cover									
Front & Rear ports	Front: one USB (Vers 2.0) Rear: two USB (Vers 2.0), keyboard, mouse, serial (9-pin), graphics (DB-15), two ethernet (RJ-45), two RJ-45 (sys mgmt) / no parallel port									
Graphics	SVGA / ATI® Radeon™ 7000m / on planar / 16MB DDR SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Security	Power-on password / administrator password / unattended boot / selectable boot sequence									
Systems mgmt	IBM Baseboard Management Controller (BMC) / H8S2168 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter II slimline with reserved connector for continuous power (no ext power reqd)					Xeon 2.8GHz SC 800MHz/2MB L2 Proc Upg 40K2503 Xeon 2.8GHz DC 800MHz/4MB L2 Proc Upg 40K2502 Xeon 3.0GHz SC 800MHz/2MB L2 Proc Upg 40K2504 Xeon 3.2GHz SC 800MHz/2MB L2 Proc Upg 40K2505 Xeon 3.4GHz SC 800MHz/2MB L2 Proc Upg 40K2506 Xeon 3.6GHz SC 800MHz/2MB L2 Proc Upg 40K2507 Xeon 3.8GHz SC 800MHz/2MB L2 Proc Upg 40K2508				
Diagnostics	Drop down light path diagnostics panel providing LED map to failing part (located on front panel)					512MB(2x256)/PC2-3200 CL3 ECC DDR2 Non-Chkp Kit 73P3523 1GB(2x512)/PC2-3200 CL3 ECC DDR2 Non-Chkp Kit 39M5818 2GB(2x1GB)/PC2-3200 CL3 ECC DDR2-SDRAM 39M5809 4GB(2x2GB)/PC2-3200 CL3 ECC DDR2-SDRAM 39M5815				
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others					IBM ServeRAID-7k Adapter 71P8642 IBM Remote Supervisor Adapter II Slim 73P9341 73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 40K1023 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD 40K1024 625W (N. America) Hot-Swap Power Supply 26K5097 NetBAY Local Console Manager 1735L04 NetBAY Remote Console Manager 1735R16 Other options at ibm.com/pc/us/accessories				
Keyboard / mouse	None standard (because rack-based)									
Power supply	Std/Max: one/two 625 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing									
Fans	Calibrated Vectored Cooling™ Std: six fans; Max: twelve (six fans with optional second power supply) / redundant with twelve fans installed; All: variable speed / hot-swap / PFA					73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 40K1023 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD 40K1024 625W (N. America) Hot-Swap Power Supply 26K5097 NetBAY Local Console Manager 1735L04 NetBAY Remote Console Manager 1735R16				
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack									

<p>Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X non hot, Bus A Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B* Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B* *slots 3 & 4 riser may be replaced with PCI-Express riser</p> <p>2U Rack</p> <p>Bay ① 3.5", 0.5", access, slim diskette Bay ② 5.25", 0.5", access, slim DVD-ROM Bay ③ 3.5", SL 1", access, hot-swap, open for disk Bay ④ 3.5", SL 1", access, hot-swap, open for disk Bay ⑤ 3.5", SL 1", access, hot-swap, open for disk Bay ⑥ 3.5", SL 1", access, hot-swap, open for disk Bay ⑦ 3.5", SL 1", access, hot-swap, open for disk Bay ⑧ 3.5", SL 1", access, hot-swap, open for disk Bays 3 through 8 support six SL disks; or 1 DDS5 Tape drive (2 slots used, additional PCI SCSI adaptor req'd) via SCA-2 connectors</p>	<ul style="list-style-type: none"> ⊘ Quick release adapter slots (no screws) ⊘ Configuration/Setup Utility: F1 at startup ⊘ Diagnostics (PC-Doctor™): F2 at startup ⊘ System Partition Boot: ALT+F1 at startup ⊘ Network Boot: F12 at startup ⊘ 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" (H 85.4mm x W 443.6mm x D 698mm) ⊘ 46.5 to 62 pounds ⊘ Stealth black color <p>All models: Max int disk capacity: 1.8TB² with six 300GB SL disks</p>
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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 time⁷
- ⊘ 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 <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊘ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

• = Hot-swap

IBM® Type-model	Qty x Processor	L3 cache	Memory	Disks	SCSI controller	Mechanical	Slots x bays	RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8686-1RQ	1 x Xeon™ MP 2.0GHz	1MB	1GB Chipkill™	None	Ultra160	3U ⁴ rack	6x5	One	One (not redund)	PCI	Jun 2003
8686-1SQ	2 x Xeon MP 2.0GHz	1MB	1GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Nov 2003
8686-1TQ	2 x Xeon MP 2.0GHz	1MB	3GB Chipkill 2 x 36.4GB	10K	Ultra160	3U rack	6x5	One	Two redundant	PCI	Nov 2003
8686-2RQ	2 x Xeon MP 2.5GHz	1MB	2GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Jun 2003
8686-3RQ	2 x Xeon MP 2.8GHz	2MB	2GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Jun 2003
Processors	1 or 2 x Intel® Xeon™ Processor MP 2.0, 2.5, or 2.8GHz ¹ with 400MHz frontside bus / Hyper-Threading technology										
L2 cache	512KB / on die of processor / at processor speed										
L3 cache	1MB or 2MB / on die of processor / at processor speed										
Processor upgrade Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI-X slots, and integrated SCSI, ethernet, graphics										
Memory	Up to 3GB std / 16GB max ^{12,13} / two (1GB model), four (2GB models) or six (3GB models) 512MB DIMMs installed / 1.7-inch tall / one memory board standard with 8 DIMM gold-connector slots / DIMMs must be installed in matched pairs / 128-bit simultaneous transfer from two DIMMs / PC1600 200MHz registered 184-pin DDR-SDRAM RDIMMs / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)										
SCSI disk controller	Adaptec® AIC-7892 / Wide Ultra160 SCSI (LVD 160MB/sec) / single channel / 64-bit 33MHz PCI / integrated on planar										
SCSI connectors	Controller hard-wired to SCSI backplane (no cable) / no external SCSI connector										
SCSI cabling	One standard 16-bit LVD cable included for attaching an optional ServeRAID adapter to the three-bay backplane; SCSI RAID adapter 68-pin connector on systemboard for this cable to get signals to three-bay backplane										
IDE controller / cabling	Enhanced IDE ATA-33 controller in OSB4 South Bridge										
Disk - capacity	None standard / supports up to 15,000 rpm disks										
Disk - bays	Three hot-swap bays / converged tray / 80-pin SCA-2 connectors										
Mechanical	EIA 19" rack models (3U⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)										
Chipset	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, and ServerWorks® OSB4 South Bridge (IDE, USB, ISA bus for Super I/O NS PC97317VUL [diskette, keyboard, mouse])										
Slots (Active™ PCI-X)	Six hot-swap PCI-X 1.0 slots ¹⁰ available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers										
RXE Expansion Port	One port to support up to 12 additional PCI-X slots via an optional IBM RXE-100 Remote Expansion Enclosure										
CD-ROM / diskette	24X-10X ⁶ CD-ROM / 3.5" 1.44MB diskette drive										
Ethernet	Intel 82559 10/100 ethernet controller / on systemboard / full duplex / 32-bit PCI / Wake on LAN® / Alert on LAN™ 2										
Graphics controller	SVGA / S3® Savage4 LT / on systemboard / 8MB SDRAM std/max / up to 1280x1024 at 64K colors at 85Hz										
Ports	Rear: RXE-100 Expansion Port (to connect optional RXE-100), RXE Management Port (to manage optional RXE-100), two USB (Ver 1.1), keyboard, mouse, analog DB-15 graphics, ethernet / no serial or parallel ports / Front: one USB (Ver 1.1)										
Security	Power-on and administrator passwords / unattended boot / selectable boot										
Systems management	Remote Supervisor Adapter / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies										
Diagnostics	Light Path Diagnostics™ / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running										
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others										
Keyboard / mouse	None standard (because rack-based)										
Power supplies	Std: one or two 370 watt hot-swap; Max: three hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA										
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										
<p>Six available 3.3 volt Active PCI-X slots:</p> <ul style="list-style-type: none"> • Bus 2 (B) with two slots supports (slots 1, 2): <ul style="list-style-type: none"> - one fullsize, 64-bit, 133MHz PCI-X, hot-swap - or two fullsize, 64-bit, 100MHz PCI-X, hot-swap - or two fullsize, 64-bit, 66MHz PCI-X, hot-swap - or two fullsize, 64-bit, 66MHz PCI, hot-swap - or two fullsize, 64-bit, 33MHz PCI, hot-swap • Bus 1 (A) with four slots supports (slots 3, 4, 5, 6): <ul style="list-style-type: none"> - four fullsize, 64-bit, 66MHz PCI-X, hot-swap - or two fullsize, 64-bit, 66MHz PCI, hot-swap - or four fullsize, 64-bit, 33MHz PCI, hot-swap • Bus 0 with one slot supports: <ul style="list-style-type: none"> - only for standard Remote Supervisor Adapter halfsize, 64-bit, 33MHz PCI, not hot-swap <p>Dimensions: H5.25" x W17.4" x D27.6" Dimensions: H133.4mm x W442.0mm x D701mm Weight: 58.4 to 70lbs; 24.9 to 31.8kg Stealth black color Tool-free serviceability Access adapters, processors, memory, and systemboard from top Access power supplies and disks from front Setup Program by pressing F1 at startup Diagnostics (PC-Doctor) by pressing F2 at startup SCSISelect by pressing Ctrl+A at startup Top cover Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director</p>											
<p>Other options at ibm.com/pc/us/accessories</p>											
<p>LIMITED WARRANTY³</p> <ul style="list-style-type: none"> ↔ 3 year parts and labor ↔ International Warranty Service³ ↔ 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 <ul style="list-style-type: none"> • 3 year IOR 24x7, 4 hr avg response (ServicePac® part num 96P2253) • 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2254) • 4 year IOR 9x5, NBD response (ServicePac part num 96P2255) • 5 year IOR 9x5, NBD response (ServicePac part num 96P2259) ↔ Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf ↔ 24x7¹⁴ toll-free support for warranty issues during the warranty period³ 											
<p>3U Rack</p> <p>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</p>											
<p>All models: Maximum internal disk capacity: 220.2GB with three 73.4GB² hot-swap SCSI disks</p>											

See footnotes for important warranty information • = Hot-swap
US models announced June 30, 2003 or November 11, 2003 (1SQ, 1TQ)
↔ US models withdrawn effective December 30, 2003 (1SQ, 1TQ)

IBM® Type-model	Qty x Processor	L2 cache	Memory	DIMM slots	Disks	SCSI controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8863-1RY	1 x Xeon™ MP 3.16GHz	1MB	2x1GB	4	None	SAS	3U ⁴ rack	6x7	1 x 1300	3	Apr 2005
8863-2RY	1 x Xeon MP 3.66GHz	1MB	2x1GB	4	None	SAS	3U rack	6x7	1 x 1300	3	Apr 2005
8863-3RY	1 x Xeon MP 7020 2.67GHz	2x1MB	2x1GB	4	None	SAS	3U rack	6x7	1 x 1300	3	Nov 2005
8863-4RY	1 x Xeon MP 7040 3.0GHz	2x2MB	2x1GB	4	None	SAS	3U rack	6x7	1 x 1300	3	Nov 2005
8863-E1Y	2 x Xeon MP 3.66GHz	1MB	4x1GB	8	3x36.4-10k	SAS w/ 8i	3U rack	6x7	2 x 1300	3	Jun 2005
8863-E5Y	2 x Xeon MP 3.66GHz	1MB	2x1GB	4	None	SAS	3U rack	6x7	2 x 1300	3	Aug 2005
8863-E6Y	2 x Xeon MP 3.16GHz	1MB	2x1GB	4	None	SAS	3U rack	6x7	2 x 1300	3	Sep 2005
8863-E7Y	4 x Xeon MP 3.66GHz	1MB	8x1GB	16	None	SAS w/ 8i	3U rack	6x7	2 x 1300	3	Sep 2005

Processors Up to two 64-bit Intel® Xeon™ Processor MP up to 3.66GHz¹ 667MHz FSB Single Core / one 64-bit Intel Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading
L2 cache 1 or 2 MB / per core / at processor speed / Xcel4v™ Dynamic Server Cache
Processor upgrade Implementation 4-way SMP / up to four Xeon Processors MP (same speed/cache size) / Dual Core Capable
 System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, and integrated SCSI, ethernet, graphics

Active Memory™ Up to 4GB std / 64GB max using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via 16-bit Checksum Chipkill™ / With 16 DIMMs installed: **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)

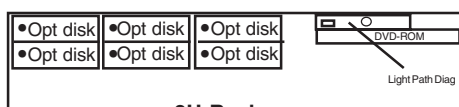
SCSI disk controller ALL: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 E1X: ServeRaid 8i
SCSI connectors Controller wired to SAS backplane
SCSI cabling One standard SAS cable attached to six-bay backplane
IDE controller / cabling Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity E1x: 3 x 36.4GB-10k / supports up to 73GB 10K rpm disks
Disk - bays Six 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors

Mechanical EIA 19" rack models (3U⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset IBM XA-64e™ 3rd Generation chipset / Integrated Processor and Memory Controller / Supports EM64T / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™) Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette 8X Slim DVD-ROM / none
Ethernet Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266MHz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports Rear: RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (Ver 2.0)

Security Power-on and administrator passwords / unattended boot / selectable boot
Systems management Remote Supervisor Adapter II Slimline (option) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics Drop down Light Path Diagnostics / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director

Keyboard / mouse None standard (because rack-based)
Power supplies Std: one or two 1300 watt hot-swap; Max: two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA
Cooling fans Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

<p>Six available 3.3 volt PCI-X 2.0 slots:</p> <p>Slot 1 - fullsize, 64-bit, 266MHz PCI-X, hot-swap Slot 2 - fullsize, 64-bit, 266MHz PCI-X, hot-swap Slot 3 - fullsize, 64-bit, 266MHz PCI-X, hot-swap Slot 4 - fullsize, 64-bit, 266MHz PCI-X, hot-swap Slot 5 - fullsize, 64-bit, 266MHz PCI-X, hot-swap Slot 6 - fullsize, 64-bit, 266MHz PCI-X, hot-swap *exclusive slot available for ServeRAID 8i adapter</p>	<p>2GB PC2-3200 CL3 ECC RDIMM (2x1GB) 73P2866 4GB PC2-3200 CL3 ECC RDIMM (2x2GB) 73P2867 8GB PC2-3200 CL3 ECC RDIMM (2x4GB) 30R5145 Active Memory 4-slot Expansion Card 13M7409 Xeon MP 3.16GHz/1MB L2 Cache Proc Upg 13N0694 Xeon MP 3.66GHz/1MB L2 Cache Proc Upg 13N0695 Xeon MP 7020 2.67GHz/2x1MB L2 Cache Proc Upg 25R8941 Xeon MP 7040 3.0GHz/2x2MB L2 Cache Proc Upg 25R8942 1300 watt Hot-Swap Power Supply (WW) 13M7413 IBM ServeRAID™-8i SAS-SCSI Adapter 13N2227 IBM ServeRAID 6M U320 256MB Adapter 02R0988 IBM 36.4GB 10K 2.5" SAS Hot-swap HDD 26K5654 IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD 26K5655 IBM Remote Supervisor Adapter II Slimline 73P9341 Dual Core X3 upgrade kit (available 12/05) 39Y6580 Other options at ibm.com/pc/us/accessories</p>
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3U Rack

Bay ① 5.25", 0.5", access, std DVD-ROM
 Bay ② 2.5", SL 1", access, hot-swap, open
 Bay ③ 2.5", SL 1", access, hot-swap, open
 Bay ④ 2.5", SL 1", access, hot-swap, open
 Bay ⑤ 2.5", SL 1", access, hot-swap, open
 Bay ⑥ 2.5", SL 1", access, hot-swap, open
 Bay ⑦ 2.5", SL 1", access, hot-swap, open

Max BTU Output:
 Ship Configuration: 1,262 Btu/hr (361 watts)
 Full Configuration: 4,053 Btu/hr (1045 watts)

Dimensions: H5.25" x W17.4" x D27.6"
 Dimensions: H133.4mm x W442.0mm x D701mm
 Weight: 63 to 83lbs; 28.6 to 37.6kg
 Stealth black color
 Tool-free serviceability
 Access adapters, power supplies, processors, memory and systemboard from top
 Setup Program by pressing F1 at startup
 Diagnostics (PC-Doctor) by pressing F2 at startup
 SCSISelect by pressing Ctrl+A at startup
 Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
 Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
 Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

LIMITED WARRANTY³

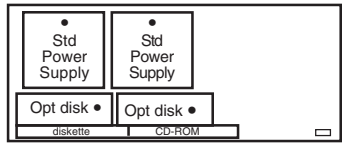
- ⇐ 3 year parts and labor
- ⇐ International Warranty Service³
- ⇐ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇐ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response 96P2253
 - 3 year IOR 24x7, 2 hr avg response 96P2254
 - 4 year IOR 9x5, NBD response 96P2255
 - 5 year IOR 9x5, NBD response 69P2259
- ⇐ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇐ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

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

IBM® Type-model	Qty x Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays	SMP/RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8870-1BX	2 x Xeon™ MP 2.2GHz	2MB	64MB	0GB Chipkill™	None	2xUltra320	4U ⁴ rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-2BX	2 x Xeon MP 2.7GHz	2MB	64MB	0GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-4BX	2 x Xeon MP 3.0GHz	4MB	64MB	0GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004

Positioning Processors	Up to 8-way (16-way two chassis) power for high-end databases, server consolidation and mission-critical business applications											
L3 cache	2 x Intel® Xeon™ Processor MP 2.2, 2.7, or 3.0GHz ¹ with 400MHz frontside bus / supports Hyper-Threading											
L4 cache	2MB or 4MB each processor / on die of processor / at processor speed											
Processor upgrade	64MB XceL4™ Server Accelerator Cache (up to 128MB with optional SMP Expansion Module) / 64MB in each SMP Expansion Module / ECC / 64-bit 400MHz bus from Cache and Scalability Controller											
SMP Expansion Module	SMP Expansion Module standard / ready for adding additional processors (up to 8 total) and memory											
Additional boards	One SMP Expansion Module std / two max / each contains four Intel 603-pin micro-PGA ZIF sockets for Xeon MP, 64MB L4 cache, sixteen DIMM sockets, three SMP Expansion Ports (second module connected via one or two SMP Expansion Ports) / each SMP Expansion Module activates one RXE Expansion Port (one RXE Expansion Port supported)											
Memory	One I/O Board (PCI-X Host Bridge, SCSI, ethernet, graphics, South Bridge, Super I/O, slot for Mgmt Adapter), one PCI Board (PCI-X Host Bridge, six PCI-X slots), one Midplane Board (connects SMP Exp Modules, I/O Board, PCI Board)											
SCSI disk controller	0GB std / 64GB max ¹³ (uses standard SMP Expansion Module) / no DIMMs installed / 32 DIMM gold-connector slots / must install two identical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / Error Checking and Correcting (ECC) and Chipkill™ via Memory ProteXion™ (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / Active Memory™ supporting hot-swap and hot-add (OS specific) and Memory Mirroring™ (non-OS specific)											
SCSI implementation	LSI Logic / Wide Ultra320 SCSI (LVD 32MB/sec) / dual channel / 64-bit 66MHz PCI / integrated RAID-1 on I/O Board											
IDE controller	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											
Disk - capacity/bays	Enhanced IDE ATA-100 controller in South Bridge / one one-drop IDE cable to backplane for diskette and CD-ROM											
Mechanical	No disks standard / supports up to 15K rpm SCSI disks / two hot-swap bays / converged tray / 80-pin SCA-2 connectors											
Chipset	EIA 19" rack models (4U ⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)											
Slots (Active™ PCI-X)	IBM XA-32™ 2nd Generation chipset / IBM Cache and Scalability Controller with L4 cache controller and three SMP Expansion Ports / IBM Memory I/O Controller with two remote I/O ports (each to a IBM PCI-X Host Bridge) / each IBM PCI-X Host Bridge provides three peer PCI buses / PCI 2.2 Bus E supports graphics, adapter slot with Remote Supervisor Adapter, VIA® 82C686B South Bridge (IDE ATA-100, USB, Super I/O PC97317VUL [keyboard, mouse]) / PCI 2.2 Bus F supports SCSI, ethernet / PCI-X Bus A, B, C, D support PCI-X slots / designed to the PCI-X 1.0 specification											
RXE Expansion Port	Six hot-swap PCI-X 1.0 slots ¹⁰ available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers											
CD-ROM / diskette	One RXE-100 Remote Expansion Enclosure can be shared between two x445 4-way, 8-way, or 16-way xSeries 445 servers or attached alone. Both PCI-X 6-packs must be installed to support RIO sharing as each server will access six additional PCI-X slots.											
Ethernet	24X-8X ⁶ DVD-ROM / 3.5" 1.44MB diskette drive / both removable from Ultrabay 2000 bays / supports CD-RW, DVD											
Graphics controller	Dual Broadcom® 5704 10/100/1000 ethernet controller / on I/O Board / full duplex / 64-bit 66MHz PCI bus / Wake on LAN®											
Ports	SVGA / ATI® Rage XL / on I/O Board / 8MB SDRAM std/max / up to 1280x1024 at 85Hz. Rear: RXE-100 Expansion Port (to connect optional RXE-100), RXE Management Port, two USB (Vers 1.1), keyboard, mouse, analog DB-15 graphics, ethernet / no serial or parallel ports / Front: one USB (Vers 1.1)											
Security	Power-on and administrator passwords / unattended boot / selectable boot											
Systems mgmt	Remote Supervisor Adapter II / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies											
Diagnostics	Light Path Diagnostics™ / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running											
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others											
Keyboard / mouse	IBM Preload Kit for 1-8 Processors 48166BU											
Power supplies	None standard (because rack-based) Std: two; max: two / hot-swap / 1200 watts at 220v or 600 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	IBM Software Subscription Update for Microsoft Windows Server Datacenter 2003 4816DBX											
	Microsoft Windows Server Datacenter 2003 33L5039											
	1GB DDR PC2100 ECC SDRAM RDIMM 33L5040											
	2GB DDR PC2100 ECC SDRAM RDIMM 33L5040											
	Xeon MP 2.2GHz/2MB L3 Cache Proc Upg 13N0723											
	Xeon MP 2.7GHz/2MB L3 Cache Proc Upg 13N0722											
	Xeon MP 3.0GHz/4MB L3 Cache Proc Upg 13N0721											
	IBM 73.4GB 10K Ultra160 SCSI Hot-Swap 06P5756											
	IBM ServeRAID™-4H Ultra160 SCSI Adapter 37L6889											
	Other options at ibm.com/pc/us/accessories											

Six available 3.3 volt Active PCI-X slots:
 Slot 1: fullsize, 64-bit 66MHz PCI-X, hot-swap Bus A
 Slot 2: fullsize, 64-bit 66MHz PCI-X, hot-swap Bus A
 Slot 3: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B
 Slot 4: fullsize, 64-bit 100MHz PCI-X, hot-swap, Bus B
 Slot 5: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus C
 Slot 6: fullsize, 64-bit 133MHz PCI-X, hot-swap, Bus D
 Slot: used by Remote Supervisor Adp, 32-bit 33MHz



- Bay ① 3.5", 0.5", access, diskette (Ultrabay 2000)
- Bay ② 3.5", 0.5", access, CD-ROM (Ultrabay 2000)
- Bay ③ 3.5", SL 1", access, hot-swap
- Bay ④ 3.5", SL 1", access, hot-swap

- Dimensions: H7.0" x W19.0" x D27.5"
- Dimensions: H178mm x W483mm x D699mm
- Max weight: 110 lbs; 50kg
- Stealth black color
- 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: 293.6GB with two 146.8GB² hot-swap SCSI disks

LIMITED WARRANTY³

- ↻ 3 year parts and labor
- ↻ International Warranty Service³
- ↻ On site, 9 hr x 5 day coverage, next day response time⁷
- ↻ 1 year on site warranty service upgrade option (in eligible locations):⁷
 - 24 hr x 7 day coverage, 2 hour response time (No ServicePac available)
- ↻ Post warranty maintenance services available
- ↻ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↻ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information (X445D8B) © IBM Corp. March 2004
 US models announced March 2, 2004 • = Hot-swap
 # = Memory, HDDs and Preload Kit for Microsoft Windows 2000 or 2003 Datacenter Edition must be ordered as part of the IBM Datacenter Solution for these models.

IBM® Type-model	Qty x Processor	L2 cache	L3 cache	Memory	DIMM slots	Disks	SCSI controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8872-1RY	2 x Xeon™ MP 2.83GHz	1MB	4MB	2x1GB	8	None	SAS	3U ⁴ rack	6x7	2 x 1300	3	Jun 2005
8872-2RY	2 x Xeon MP 3.0GHz	1MB	8MB	2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Jun 2005
8872-3RY	2 x Xeon MP 3.33GHz	1MB	8MB	2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Jun 2005
8872-5RY	2 x Xeon MP 7020 2.66GHz	2MB		2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2005
8872-6RY	2 x Xeon MP 7040 3.0GHz	2x2MB		2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2005

Processors Two 64-bit Intel® Xeon™ Processor MP up to 3.33GHz¹ 667MHz FSB Single Core / Two 64-bit Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading technology
L2 cache 1 or 2MB / per core / XceL4v™ Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache 4 or 8MB / integrated / at processor speed
Processor upgrade 4-way SMP / up to four Xeon Processors (same speed/cache/core) per chassis / Dual Core Capable / up to 32-way (eight chassis interconnected)
Implementation System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, and integrated Serial Attached SCSI, ethernet, graphics

Active Memory™ 2GB std / 64GB max per chassis using high-capacity memory card / 512GB max (eight chassis interconnect) / two memory cards standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ / Memory ProteXion™ (redundant bit steering) and Memory Mirroring™ and Hot-swap (non-OS specific) / Hot-add supported only with Microsoft® Windows™ Server 2003™

SCSI disk controller ALL: Adaptec® AIC-9410 / Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / ServeRaid 8i optional with dedicated slot
SCSI connectors Controller wired to SAS backplane
SCSI cabling One standard SAS cable attached to six-bay backplane
IDE controller / cabling Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity None / supports up to 73GB 10,000 rpm disks
Disk - bays Six 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical EIA 19" rack models (3U⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER) / connect eight chassis (x460 or MXE-460) to achieve 32-way in 24U

Chipset IBM XA-64e™ 3rd Generation chipset / Integrated Processor and Memory Controller / Supports EM64T / Support for external scalability and memory control / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots

Slots (Active™) Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz

CD-ROM / diskette 8X⁶ Slim DVD-ROM / none
Ethernet Broadcom® 5704 10/100/1000 dual ethernet per chassis / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2

Graphics controller SVGA / ATI® 7000M / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports Rear: Three Scalability ports, RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / Front: One USB (Ver 2.0)

Security Power-on and administrator passwords / unattended boot / selectable boot
Systems management Remote Supervisor Adapter II slimline / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies

Diagnostics Drop down Light Path Diagnostics / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director)

Software ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director

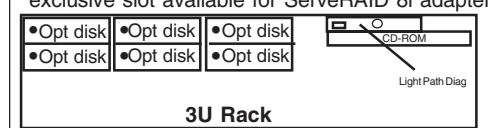
Keyboard / mouse None standard (because rack-based)
Power supplies Std: Two 1300 watt hot-swap; Max: two hot-swap / fully redundant with two power supplies / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA

Cooling fans Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

- 8W = 2 x XpandOnDemand Scalability kits 2.3m
- 16W = 6 x XpandOnDemand Scalability kits 2.3m
- 32W = 8 x XpandOnDemand Scalability kits 2.3m + 4 x2.9m
- Six available 3.3 volt PCI-X 2.0 slots:
- Slot 1 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
- Slot 2 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
- Slot 3 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
- Slot 4 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
- Slot 5 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
- Slot 6 - fullsize, 64-bit, 266MHzPCI-X, hot-swap

*exclusive slot available for ServeRAID 8i adapter

- Dimensions: H5.05" x W17.32" x D28.15"
- Dimensions: H128.35mm x W440.0mm x D715mm
- Weight: 70 to 85lbs; 31.75 to 38.5kg
- Stealth black color
- Tool-free serviceability
- Access adapters, power supplies, processors, memory and systemboard from top
- Setup Program by pressing F1 at startup
- Diagnostics (PC-Doctor) by pressing F2 at startup
- SCSISelect by pressing Ctrl+A at startup
- Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
- Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
- Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director



- Bay ① 5.25", 0.5" access, std CD-ROM
- Bay ② 2.5", SL 1", access, hot-swap, open
- Bay ③ 2.5", SL 1", access, hot-swap, open
- Bay ④ 2.5", SL 1", access, hot-swap, open
- Bay ⑤ 2.5", SL 1", access, hot-swap, open
- Bay ⑥ 2.5", SL 1", access, hot-swap, open
- Bay ⑦ 2.5", SL 1", access, hot-swap, open

Max BTU Output:
 Ship Configuration: 1,262 Btu/hr (370 watts)
 Full Configuration: 4,094 Btu/hr (1200 watts)

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 time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response 96P2688
 - 3 year IOR 24x7, 2 hr avg response 96P2689
 - 4 year IOR 9x5, NBD response 96P2690
 - 5 year IOR 9x5, NBD response 96P2694
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

All models: Maximum internal disk capacity: 440.4GB with six 73.4GB² hot-swap SAS disks

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8677-3XX	HS20/HS40/JS20/JS21/LS20	0 / 14	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2000W	2 / 2	7U ⁴ rack	Oct 2004
8677-3RX	HS20/HS40/JS20/JS21/LS20	0 / 14	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2000W	2 / 2	7U rack	Mar 2006
Positioning Description	Flexible, innovative design provides investment protection and reduces deployment costs Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (diskette drive, optical drive, and ports for USB, keyboard, video, mouse)									
Blade bays	Supports all blades HS20/HS40/JS20/JS21/LS20 and SCSI Storage Expansion Units / 14 hot-pluggable bays / front access									
Switch modules	Std: none; max: four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru									
Advanced Management Module	Std: none; max: two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 14 blade servers									
Management Module	Std: one; max: one or two / hot-swap / rear access / comprehensive system management functions / PowerPC® 401 controller / communicates with integrated system management processor on each server blade / multiplexor for console connectivity / ports: DB-15 analog video port, PS/2 keyboard port, PS/2 mouse port, 10/100 ethernet remote management connection port / all ports shared by up to 14 blade servers									
Power modules	Std: two in bays 1 and 2 (two 9ft IEC 320-C13 to C14 or two IEC 320-C19 to C20 cables for intrarack power distribution); max: four / hot-swap / rear access / 2000 watts at 220v / both redundant to each other (N+N redundancy) / two std modules supply power to all modules and blade bays 1 through 6 / power for bays 7 through 14 requires two additional power modules in bays 3 and 4 (redundant to each other) / worldwide / voltage-sensing / auto-restart / no fans power module(s)									
Blower modules	Std: two; max: two / hot-swap / redundant / variable speed / rear access / 325 cubic ft per min (CFM) / front to back airflow									
Mechanical CD / diskette / USB	EIA 19" rack models (7U⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 ER, NetBAY42 SR) 1XX/2XX: 24X-10X ⁶ CD-ROM 3XX: 8X-24X ⁶ DVD-ROM / 3.5" 1.44MB diskette drive / one USB port (Version 1.1) / all USB interface / not removable / front access / shared by up to 14 blade servers / requests for CD-ROM, diskette drive, and USB port by pressing CD select button on server blade front panel									
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions									
Ports	Rear: keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / Front: one USB (Version 1.1)									
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures									
Ethernet	One of the dual integrated gigabit ethernet controllers on each blade server connects to an optional 4-port GB Ethernet Switch Module (the second ethernet controller requires a second optional 4-port GB Ethernet Switch Module)									
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software									
System LED panel	System LED panel provides power-on, location, over-temperature, information, and system-error conditions									

Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888	IBM Advanced Management Module	25R5778
Cisco Systems Gigabit Ethernet Switch Module	32R1892	IBM KVM/Redundant Management Module	48P7055
Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module	32R1859	1U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17231UX
Brocade 10 port 4Gb SAN Switch Module	32R1813	2U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17232UX
Brocade 20 port 4Gb SAN Switch Module	32R1812	IBM BladeCenter 4-port GB Ethernet Switch Module	48P7054
Cisco Systems InfiniBand Switch Module for BladeCenter	32R1900	IBM BladeCenter 2-port Fibre Channel Switch Module	48P7062
NetBAY42 Enterprise Rack Cabinet	930842S	IBM 2-button mouse PS/2	28L3673
NetBAY42 Standard Rack Cabinet	9306420	IBM T115 15" Flat Panel Color Monitor (black)	494215U
NetBAY25 Standard Rack Cabinet	9306250	APC Smart-UPS 5000RMB (208V)	37L6861
IBM 2000W Power Supply Module (includes two modules)	26K4816	• Other options at ibm.com/pc/us/accessories	

Front

LED panel Bay 1 Bay 2

USB CD-ROM USB Diskette

B 1 B 2 B 3 B 4 B 5 B 6 B 7 B 8 B 9 B 10 B 11 B 12 B 13 B 14

Rear

SM 3 SM 1 PM 3 Blower module 1 (std) PM 1 M M 1

SM 4 SM 2 PM 4 Blower module 2 (std) PM 2 M M 2

Switch modules Power modules Management module (both std) (std)

- ↳ 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 server blades and SCSI Expansion Units from front
- ↳ Access modules from rear
- ↳ Midplane in center of system to interface for all major system components
- ↳ Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

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)
4	Network connection 2 for all blade server I/O expansion options (Fibre Channel)

LIMITED WARRANTY³

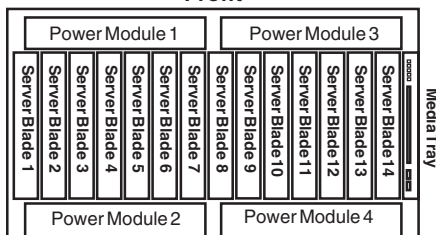
- ↳ **3 year parts and labor**
- ↳ **International Warranty Service³**
- ↳ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↳ **On site service upgrade options (in eligible locations):⁷**
 - **3 year IOR 24x7, 2 hr avg response** (ServicePac® part num 21P2065)
 - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 21P2085)
 - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41L2736)
 - **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9207)
 - **5 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9209)
- ↳ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↳ **24x7¹⁴ toll-free support for warranty issues during the warranty**

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Advanced Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8852-4XX	HS20/HS40/JS20/JS21/LS20	0 / 14	0 / 10	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2900W	2 / 2	9U ⁴ rack	Mar 2006
Positioning Description	Revolutionary design provides the most efficient infrastructure building block for adding scale and capacity Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (optical drive, USB and video)									
Blade bays	Supports all blades: HS20/HS40/JS20/JS21/LS20 and Blade Expansion Units / 14 hot-swappable bays / front access									
Switch modules	Std: none; max: ten / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru / Nortel Networks™ / Cisco™ / QLogic™ / Brocade® / McData®									
Advanced Management Modules	Std: one; max: two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port									
Power modules	Std: two; max: four / hot-swap / front access / 2900 watts at 220V / redundant within pair (N+N redundancy) / two std modules supply power to blade bays 1 through 7 and both AMMs, SMs 1 & 2, and all fans / two optional modules in bays 3 and 4 required if blade bays 8-14 or IO bays 5-10 used / worldwide / voltage-sensing / auto-restart / 3 fans per power module									
Blower modules	Std: two; max: two / hot-swap / redundant / throttled according to incoming air temperature / rear access / front to back airflow									
Mechanical Media Tray	EIA 19" rack models (9U⁴) x 29" deep / supported in NetBAY™ Racks (such as NetBAY42 ER) DVD-ROM / two USB ports (Version 2.0) / Full Light Path Diagnostic panel / customer serviceable / front access / shared by all blade servers / requests for DVD-ROM and USB port by pressing DVD select button on server blade front panel									
Keyboard / mouse	None standard / USB / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions									
Ports	Rear: two USB, two RJ45 (one ethernet and one serial), analog DB-15 graphics (on advanced mgmt module) / one serial aggregate for break out cable; Front: two USB (Media Tray)									
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures									
Ethernet	Each of the dual integrated gigabit ethernet controllers on each blade connects to an optional <i>GB Ethernet Switch Module</i>									
Systems mgmt	Provides remote console and mgmt / power on/off/reset blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager									
System LED panel	System LED panel provides power-on, location, over-temperature, information, and system-error conditions									

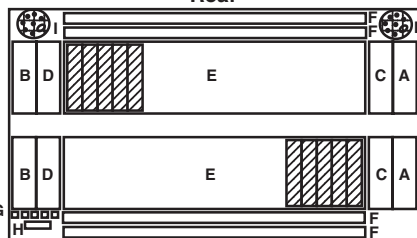
1U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17231UX	BladeCenter H 2900W Power Module pair with Fan Packs	31R3335
2U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17232UX	IBM Advanced Management Module	25R5778
NetBAY ACT Local Console Manager (CAT5 KVM cabling)	1735L04	BladeCenter H Double 30A NEMA L6-30P (208V) 4.3M	25R5783
NetBAY ACT Remote Console Manager (CAT5 KVM cabling)	1735R16	BladeCenter H Dual 32A IEC 309 P+N+G/16A IEC 320-C20 (230V) 4.3M	25R5784
NetBAY ACT 250mm KVM Conversion Option	32P1636	BladeCenter H Triple 16A IEC 320-C20 (200-240V) 2.8M	25R5785
NetBAY ACT 1.5m KVM Conversion Option	32P1652	BladeCenter H Double 30A KSC 8305 (220V) 4.3M (Korea)	25R5811
Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888	BladeCenter H Dual 32A AS/NZS 3112/16A IEC 320-C20 (ANZ)	25R5812
Cisco Systems Gigabit Ethernet Switch Module	32R1892	BladeCenter H Serial Port Breakout Cable	25R5806
Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module	32R1859	IBM BladeCenter 4-port GB Ethernet Switch Module	48P7054
Brocade 10 port 4Gb SAN Switch Module	32R1813	IBM BladeCenter 2-port Fibre Channel Switch Module	48P7062
Brocade 20 port 4Gb SAN Switch Module	32R1812		
Cisco Systems InfiniBand Switch Module for BladeCenter	32R1900		
NetBAY42 Enterprise Rack Cabinet	930842S		

• Other options at ibm.com/products/us
• Solutions available from IBM BladeCenter Alliance program partners

Front



Rear



- ◇ Dimensions: H15.75" x W19" x D29"
- ◇ Dimensions: H400.05mm x W482.6mm x D766.6mm
- ◇ Weight: 90 to 350 lb; 40.82 to 158.8kg
- ◇ Stealth black color bezel
- ◇ Tool-free customer serviceability
- ◇ Access server blades, expansion units and power modules from front
- ◇ Access modules from rear
- ◇ Midplane in center of system to interface for all system components
- ◇ Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

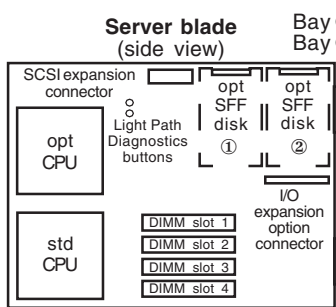
- A • Advanced Management Module
- B • Switch Module Bays 1 & 2 (dedicated ethernet)
- C • Switch Module Bays 3 & 4 –OR– Bridge Slots
- D • Dedicated Bridge Module Slots (up to 4)
- E • Blowers (2)
- F • High Speed Switch Module Bays (4)
- G • Light Path Diagnostic Panel
- H • Aggregated Serial Connector
- I • Consolidated Redundant Power Inputs (2)

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 time⁷
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2085)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9209)
- Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty

IBM® Type-model	Processor GHz¹	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	SCSI Support with optional stor exp unit	slots x bays	Mechanical Ethernet	Available date
8843-L1U	1 x Xeon™ 2.8LV	1MB	800	512MB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Feb 2005
8843-J1U	1 x Xeon 2.8LV	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Feb 2005
8843-M5U	1 x Xeon 3.0LV	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Feb 2005
8843-01U	1 x Xeon 2.8	1MB	800	512MB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2004
8843-0RU	1 x Xeon 2.8	2MB	800	1GB	36GB	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Mar 2006
8843-E7U	1 x Xeon 2.8	2MB	800	512MB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2005
8843-11U	1 x Xeon 3.0	1MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2004
8843-2RU	1 x Xeon 3.2	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Mar 2006
8843-E2U	1 x Xeon 3.2	2MB	800	2GB	36GB	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Mar 2005
8843-3RU	1 x Xeon 3.4	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Mar 2006
8843-41U	1 x Xeon 3.6	1MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2004
8843-4RU	1 x Xeon 3.6	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Mar 2006
8843-5RU	1 x Xeon 3.8	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Mar 2006
8843-E9U	2 x Xeon 3.8	2x2MB	800	4GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2005

Processor(s)	1 or 2 x Intel® Xeon up to 3.8GHz with 800MHz frontside bus (FSB) / EM64T / 1-2MB L2 ECC Cache / Hyper-Threading technology / L1U, J1U and M5U: Features Low Voltage Processor for reduced heat output allowing greater rack population	
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 1MB std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet	
Memory	512MB/1GB std / 16GB ¹³ max / two slots used / two slots available / PC2-3200 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel	
SCSI disk controller	LSI Logic® 53C1020 SCSI controller / Single channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-1 & 1E mirroring / One 16-bit channel (one internal) / Internal channel: one 2-drop 16-bit 68-pin LVD SCSI cable	
SCSI Disk bays	Two 2.5-inch Small Form Factor (SFF) Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; all SCSI bays Ultra320-enabled) /	
External Storage	Support for IBM TotalStorage™ solutions (including FAST and NAS family of products)	
Mechanical Architecture/Chipset	7U ⁴ Blade / Supported in IBM BladeCenter 8677-3XX or 8677-1XX/2XX (requires upgrade to 2000W power supply option 26K4816) Intel E7520 chipset / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface	
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)	
Ethernet	Dual gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM)	
Network Interface	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release ²⁰	
CD / Diskette / USB Kybd / video / mouse Graphics controller	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector	
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2168 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module	Xeon 2.8GHz/800/2MB L2 Cache EM64T Proc Upg 25F8878 Xeon 3.0GHz/800/2MB L2 Cache EM64T Proc Upg 25F8877 Xeon 3.2GHz/800/2MB L2 Cache EM64T Proc Upg 25F8876 Xeon 3.4GHz/800/2MB L2 Cache EM64T Proc Upg 13N0660 Xeon 3.6GHz/800/2MB L2 Cache EM64T Proc Upg 13N0696 Xeon 3.8GHz/800/2MB L2 Cache EM64T Proc Upg 13N0697
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	512MB (2x256) PC2-3200 ECC DDR2 73P3523 1GB (2x512) PC2-3200 CL3 ECC DDR2 39M5818 2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit 39M5809 4GB (2x2GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit 39M5152 8GB (2x4GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit 30R5145
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	IBM 36.4GB 10K Ultra320 SCSI 2.5" SFF NHS HDD 40K1037 IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD 40K1038
Software ship group	Documentation CD, Broadcom CD	BladeCenter SCSI Storage Exp Unit 26K4817 BladeCenter SFF Fibre Channel Exp Card 26K4841 BladeCenter SFF Gigabit Ethernet Exp Card 26K4842
Cooling Fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel	Other options at ibm.com/pc/us/accessories
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system	



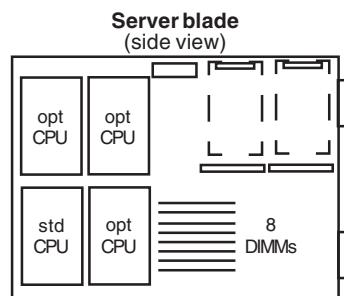
- Bay ① 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk
 - Bay ② 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk
 - Stealth black front bezel
 - H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
 - 12 lbs; 5.4kg (max configuration)
 - Configuration/Setup Utility: F1 at startup
 - Diagnostics (PC-Doctor™): F2 at startup
 - System Partition Boot: ALT+F1 at startup
 - Network Boot: F12 at startup
 - PXE Boot Agent Utility: Ctrl+S at startup
 - Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
 - Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director
- Maximum internal disk capacity for each HS20 blade server¹³:
146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 146GB for total of 438GB)

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
 - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9523)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-model	Qty x Processor ¹	L3 Cache Memory	Frontside Bus Mhz	Disk controller	Disk bays	SCSI support with optional expansion unit	Slots x bays	Mechanical	Required chassis	Available date
8839-41X	1 x Xeon™ 2.8GHz MP	2MB	400Mhz	None	None	2 hot-swap Ultra320	0x2	6U ⁴ blade	BladeCenter	Mar 2004

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> 1 x Intel® Xeon 2.8GHz MP with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture 512KB L2 Cache / 2MB L3 Cache / on die of processor / at processor speed 4-way SMP / up to four Xeon MP Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion unit connector, two I/O expansion option connectors, integrated graphics and four ethernet ports																													
Memory	2GB std / 16GB max ¹³ / two slots used / six slots available / eight total slots PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed																													
SCSI disk controller	None / supports optional SCSI Storage Expansion Unit (a blade occupying adjacent blade slot / connects to HS40 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports RAID-1 mirroring [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)																													
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / all SCSI bays Ultra320-enabled																													
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)																													
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products																													
Architecture / chipsets	ServerWorks® Grand Champion™ 4.0 LE / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / double slot one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip																													
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)																													
Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional 4-port GB Ethernet Switch Module (the second controller requires a second optional Ethernet Switch Module)																													
Network-interface	Two connectors for I/O expansion option / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)																													
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel																													
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel																													
Graphics	SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																													
Systems mgmt	Intel integrated Baseboard Management Controller (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module																													
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																													
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																													
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD																													
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel																													
Power supply	Uses power module(s) in BladeCenter (type 8677)																													
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system																													
	<table border="0"> <tr> <td>Xeon 2.8Ghz/2MB L3 Cache Proc Upg</td> <td>13N0653</td> </tr> <tr> <td>512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM</td> <td>33L5038</td> </tr> <tr> <td>1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td>33L5039</td> </tr> <tr> <td>2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td>33L5040</td> </tr> <tr> <td>IBM HS40 SCSI Storage Expansion Unit (blade)</td> <td>26K4847</td> </tr> <tr> <td>IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)</td> <td>48P7061</td> </tr> <tr> <td>36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*</td> <td>06P5768</td> </tr> <tr> <td>36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*</td> <td>06P5776</td> </tr> <tr> <td>73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*</td> <td>06P5756</td> </tr> <tr> <td>146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*</td> <td>32P0728</td> </tr> </table> <p>* Disk requires SCSI Storage Expansion Unit</p>										Xeon 2.8Ghz/2MB L3 Cache Proc Upg	13N0653	512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038	1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039	2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040	IBM HS40 SCSI Storage Expansion Unit (blade)	26K4847	IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)	48P7061	36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776	73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756	146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728
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Server blade (side view)

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

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

LIMITED WARRANTY³

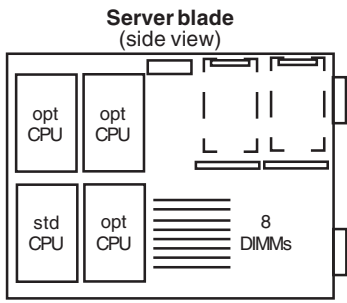
- ↻ 3 year parts and labor
- ↻ International Warranty Service³
- ↻ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↻ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
 - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↻ 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

See footnotes for important warranty information

⚠ US model announced February 17, 2004; withdrawn effective June 29, 2004

IBM® Type-model	Qty x Processor ¹	L3 Cache Memory	Frontside Bus Mhz	Disk controller	Disk bays	SCSI support with optional expansion unit	Slots x bays	Mechanical	Required chassis	Available date
8839-51X	1 x Xeon™ 2.2GHz MP	2MB 1GB	400Mhz	None	None	2 hot-swap	Ultra320	0x2 7U ⁴ blade	BladeCenter	Mar 2004
8839-61X	1 x Xeon™ 2.7GHz MP	2MB 2GB	400Mhz	None	None	2 hot-swap	Ultra320	0x2 7U ⁴ blade	BladeCenter	Mar 2004
8839-71X	1 x Xeon™ 3.0GHz MP	4MB 2GB	400Mhz	None	None	2 hot-swap	Ultra320	0x2 7U ⁴ blade	BladeCenter	Mar 2004

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> 1 x Intel® Xeon MP up to 3.0GHz with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture 512KB L2 Cache / Up to 4MB L3 Cache / on die of processor / at processor speed 4-way SMP / up to four Xeon MP Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion unit connector, two I/O expansion option connectors, integrated graphics and four ethernet ports									
Memory	Up to 2GB std / 16GB max ¹³ / 51X: two slots used 61X/71X: four slots used / eight total slots PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed									
SCSI disk controller	None / supports optional SCSI Storage Expansion Unit (a blade occupying adjacent blade slot / connects to HS40 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports RAID-1 mirroring [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)									
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / all SCSI bays Ultra320-enabled									
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)									
Mechanical Architecture / chipsets	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / double slot one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip									
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)									
Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional 4-port GB Ethernet Switch Module (the second controller requires a second optional Ethernet Switch Module)									
Network-interface	One connector for I/O expansion option / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)									
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel									
Kybd / video / mouse Graphics	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	Intel integrated Baseboard Management Controller (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module									
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)									
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode									
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD									
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel									
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system									
						Xeon 2.2Ghz/2MB L3 Cache Proc Upg 13N0656 Xeon 2.7Ghz/2MB L3 Cache Proc Upg 13N0655 Xeon 3.0Ghz/4MB L3 Cache Proc Upg 13N0654 512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5038 1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5039 2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5040 IBM HS40 SCSI Storage Expansion Unit (blade) 26K4847 IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module) 48P7061 36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD* 06P5768 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* 06P5776 73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* 06P5756 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD* 32P0728 * Disk requires SCSI Storage Expansion Unit				



- A control panel on top front of blade has following LEDs:
- Power good
 - Blade location
 - Over temperature
 - Information
 - General fault

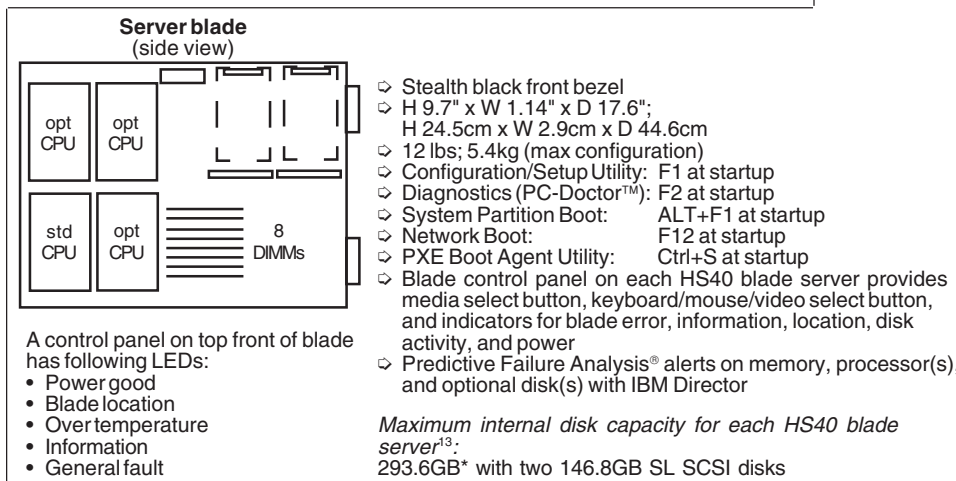
- ▷ Stealth black front bezel
 - ▷ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
 - ▷ 12 lbs; 5.4kg (max configuration)
 - ▷ Configuration/Setup Utility: F1 at startup
 - ▷ Diagnostics (PC-Doctor™): F2 at startup
 - ▷ System Partition Boot: ALT+F1 at startup
 - ▷ Network Boot: F12 at startup
 - ▷ PXE Boot Agent Utility: Ctrl+S at startup
 - ▷ Blade control panel on each HS40 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
 - ▷ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director
- Maximum internal disk capacity for each HS40 blade server¹³: 293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY³

- ↪ 3 year parts and labor
- ↪ International Warranty Service³
- ↪ 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 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)
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- ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

IBM® Type-model	Qty x Processor ¹	L3 Cache Memory	Frontside Bus Mhz	Disk controller	Disk bays	SCSI support with optional expansion unit	Slots x bays	Mechanical	Required chassis	Available date
8839-21X	1 x Xeon™ 2.0GHz MP	1MB 1GB	400Mhz	None	None	None	2 hot-swap Ultra320	0x2 7U ⁴ blade	BladeCenter	Apr 2004

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> 1 x Intel® Xeon 2.0GHz MP with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture 512KB L2 Cache / 1MB L3 Cache / on die of processor / at processor speed 4-way SMP / up to four Xeon Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion connector, one I/O expansion option connector, and integrated graphics and dual ethernet																													
Memory	1GB std / 16GB max ¹³ / two slots used / six slots available / eight total slots PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed																													
SCSI disk controller	None / supports optional SCSI Storage Expansion Unit (a blade occupying adjacent blade slot / connects to HS40 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports RAID-1 mirroring [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)																													
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / all SCSI bays Ultra320-enabled																													
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)																													
Mechanical Architecture / chipsets	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / double slot one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip																													
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)																													
Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional 4-port GB Ethernet Switch Module (the second controller requires a second optional Ethernet Switch Module)																													
Network-interface	One connector for I/O expansion option / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)																													
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel																													
Kybd / video / mouse Graphics	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																													
Systems mgmt	Intel integrated Baseboard Management Controller (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module																													
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																													
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																													
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD																													
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel																													
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system																													
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LIMITED WARRANTY³

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 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
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 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
 - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

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

IBM® Type-model	Qty x Processor	GHz	Core	L2 cache	Memory	Disk controller	Disk bays	Optional storage expansion unit	slots x bays	Mechanical	Ethernet	Available date
8844-31U	2 x PPC 970MP	2.7*	SC	1MB	2x512MB	Open SAS	2 Fixed	3 Hot Swap SAS**	0 x 2	9.5mm blade	2 x Gigabit	Mar 2006
8844-51U	2 x PPC 970MP	2.5*	DC	2x1MB	2x1GB	Open SAS	2 Fixed	3 Hot Swap SAS**	0 x 2	9.5mm blade	2 x Gigabit	Mar 2006

Positioning Processor(s) L2 Cache SMP support Implementation	The IBM BladeCenter server for AIX 5L™, HPC Linux Clusters and server consolidation through virtualization 2 x IBM PowerPC™ 970MP up to 2.7GHz* Single-Core / up to 2.5GHz* Dual-Core / 64 bit 1MB L2 Cache per core 2-core or 4-core SMP / up to two PowerPC Processors (same speed/cache size) Server blade contains two IBM PowerPC microprocessors soldered to planar, four DIMM slots, 17X PCI Express, SAS controller, Fibre Channel, Myrinet and InfiniBand expansion card support, integrated graphics and dual Gigabit ethernet											
Memory	1GB or 2GB std / 16GB ¹³ max / two slots used / two slots available / PC2-3200 400MHz CL3 ECC DDR2-SDRAM DIMMs or PC2-4200 533MHz CL4 ECC DDR2-SDRAM DIMMs / four DIMM gold-connector slots / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual-channel / Chipkill with x4 DIMMs											
SAS Disk controller	One integrated / Citrine SAS controller / two port / on planar / 64-bit 133MHz PCI-X / supports RAID-0 & 10											
SAS Disk bays	Supports max of two non-hot-swap 2.5" / small form factor (SFF) SCSD SAS drives / 3.0GB/s											
External Storage	Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)											
Mechanical Architecture/Chipset	Single-wide Blade / Supported in IBM BladeCenter, IBM BladeCenter T** and IBM BladeCenter H IBM U4 Northbridge / BCM5780 PCI Express, PCI-X Bridge and HyperTransport Tunnel for PCIe and Dual Gigabit Ethernet / AMD 8111 Southbridge providing USB1.1 and Video / NS PC87427 Super I/O off LPC interface											
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)											
Ethernet Controllers	Dual Gigabit 10/100/1000 ethernet controller / Broadcom® 5780 / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM)											
Network Interface	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release ²⁰											
DVD / Diskette / USB Kybd / video / mouse Graphics controller	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® RN50 on Planar / 32MB DDR SDRAM std and max / 15 pin connector											
Systems Mgmt	IBM Integrated Service Processor / H82166 / IPMI 1.5 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module / Cluster System Management / IBM Power Executive										1GB (2x512MB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2703 2GB (2x1GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2707 4GB (2x2GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2711 1GB (2x512MB) PC2-3200 ECC CL3 DDR2 RDIMM Kit 39M5821 2GB (2x1GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit 39M5809 4GB (2x2GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit 39M5812 8GB (2x4GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit 41Y2703 IBM 36GB 10K SAS 2.5" SFF NHS HDD 26K5776 IBM 73GB 10K SAS 2.5" SFF NHS HDD 26K5777 QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter 26F0890 BladeCenter SFF Gigabit Ethernet Expansion Card for BladeCenter 39R8624 TopSpin InfiniBand Expansion Card for BladeCenter 26K6457 Myrinet Expansion Card for BladeCenter 73P6000 BladeCenter Optical Pass-thru Module 39Y9320	
Diagnostics	Light Path Diagnostics (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)											
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode											
Software ship group	Documentation CD, IBM Director CD, Device Driver CD											
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel											
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system										Other options at ibm.com/pc/us/accessories	

Server blade (side view)

- opt SFF disk
- opt SFF disk
- std CPU
- Light Path Diagnostics buttons
- DIMM slot 1
- DIMM slot 2
- DIMM slot 3
- DIMM slot 4
- expansion option connector
- PCIe connector

Bay ① 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSD disk
Bay ② 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSD disk

- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- 31U 2-core 288W / 51U 4-core 308W
- 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 JS21 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

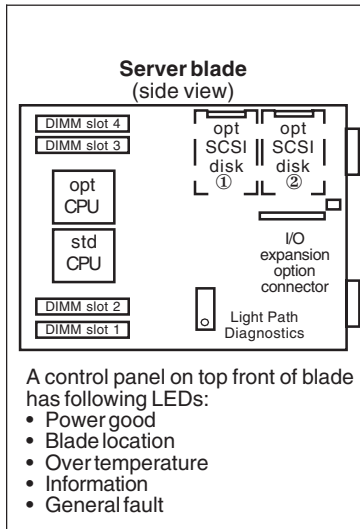
Maximum internal disk capacity for each JS21 blade server³:
146GB with two 73GB SCSI disks (with BladeCenter Storage Expansion Unit 3 x 73GB for total of 219GB**)

*Processor frequency is dependent upon which BladeCenter chassis the JS21 is installed:
BladeCenter (8677): 31x, 2.6GHz; 51x, 2.3GHz
BladeCenter H (8852): 31x, 2.7GHz; 51x, 2.6GHz
BladeCenter T (8720): 31x, 2.6GHz; 51x, 2.3GHz
**BladeCenter T and BladeCenter Storage Expansion Unit support available 3rd Quarter 2006

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
 - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9523)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-model	Qty x Processor ¹	Speed/Core	L2 Memory Cache	Disk controller	Disk bays	SCSI support	Slots x bays	Mechanical	Required chassis	Available date
8850-51U	1 x Opteron 246	2.0 GHz/SC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U ⁴ blade	BladeCenter	Apr 2005
8850-55U	1 x Opteron 270	2.0 GHz/DC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Apr 2005
8850-65U	1 x Opteron 275	2.2 GHz/DC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Jul 2005
8850-71U	1 x Opteron 250	2.4 GHz/SC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Apr 2005
8850-81U	1 x Opteron 252	2.6 GHz/SC	2GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Apr 2005
Positioning Processor(s) L2/L3 Cache SMP support Implementation	Ultra-dense, low power, full performance modular computing platform with superior performance Up to 2 x AMD® Opteron / 280 Dual Core 2.4GHz / 254 Single Core 2.8GHz / simultaneously supports 32-bit and 64-bit computing 1MB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O 2-way SMP / up to two Opteron processors (same speed/cache size) Server blade contains two AMD 940 micro PGA ZIF sockets, four memory DIMM slots, two SCSI connectors, Myrinet and InfiniBand expansion card support, integrated graphics and dual ethernet									
Memory	1 or 2GB std / 16GB max¹³ / two slots used / two slots available PC3200 266MHz registered 184-pin ECC DDR VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)									
IDE controller/bays SCSI disk controller	None One integrated / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B / on planar / supports RAID-1 mirroring [Embedded Mirroring] with two non-hot-swap 2.5" / small form factor (SFF) drives / one 16-bit internal channel / no cables or external connector)									
SCSI disk bays	Supports max of two not hot-swap 2.5" SL Ultra320 SCSI disks 40-pin SCA-2 connectors / all SCSI bays Ultra320-enabled									
Other controllers External storage	Support for SFF or legacy Ethernet or Fibre Channel I/O cards, Myrinet or InfiniBand Expansion cards Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)									
Mechanical Architecture / chipsets	Supported in IBM BladeCenter / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products / Alert 8131 PCI-X Bridge Chip providing two PCI-X buses running at 600Mhz (bus A for SCSI and Ethernet, bus B for PCI-X expansion slots) / AMD 8111 HyperTransport Bridge Chip supporting a 200 Mhz double-pumped HyperTransport clock (PCI, SMBus, USB, LPC to BIOS and Super I/O) / National Semiconductor® PC87417 Super I/O chip									
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)									
Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full-duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Passthrough Module</i> (the second controller requires a second optional switch or PM)									
Network-interface	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release ²⁰									
DVD / diskette / USB Kybd / video / mouse Graphics	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon Mobility 7000M / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	IBM integrated system management processor (ISMP) / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module					Low Power Opteron 246 Processor Upgrade Low Power Opteron 250 Processor Upgrade Low Power Opteron 252 Processor Upgrade Low Power Opteron 254 Processor Upgrade Low Power Opteron 270 Processor Upgrade Low Power Opteron 275 Processor Upgrade Low Power Opteron 280 Processor Upgrade				
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)					2GB (2x1GB kit) DDR-SDRAM VLP RDIMM 4GB (2x2GB kit) DDR-SDRAM VLP RDIMM 8GB (2x4GB kit) DDR-SDRAM VLP RDIMM IBM 36.4GB SFF Non-hot-swap 10K SCSI HD IBM 73.4GB SFF Non-hot-swap 10K SCSI HD AMD Opteron LS20 Low Profile Handle BladeCenter SCSI Storage Exp Unit IBM SFF Fibre Channel Expansion Card IBM SFF Gigabit Ethernet Expansion Card IBM HS20 Fibre Channel Expansion Card				
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode					40K1037 40K1038 25R7748 26K4817 26K4841 26K4842 48P7061				
Software ship group	Documentation CD, IBM Director CD, Device Driver CD					Other options at ibm.com/pc/us/accessories				
Cooling fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel									
Power supply Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system									



- Bay ① 2.5", 9.5mm, no front access, optional SFF SCSI disk
 - Bay ② 2.5", 9.5mm, no front access, optional SFF SCSI disk
 - Stealth black front bezel
 - H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
 - 11 lbs; 5.0kg (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 LS20 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 LS20 blade server¹³: 146GB with two 73.4GB SFF SCSI disks*

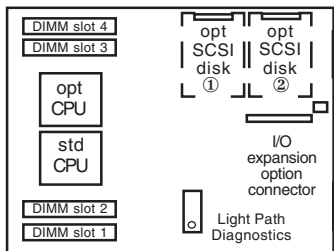
LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 41C5906)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 41C5907)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 41C5908)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 41C5909)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 41C5910)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 41C5911)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
US models announced May 3, 2005 and July 12, 2005

IBM® Type-model	Qty x Processor ¹	Speed/Core	L2 Memory Cache	Disk controller	Disk bays	SCSI support	Slots x bays	Mechanical	Required chassis	Available date
8850-56U	1 x Opteron 270	2.0 GHz/DC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-66U	1 x Opteron 275	2.2 GHz/DC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-72U	1 x Opteron 250	2.4 GHz/SC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-76U	1 x Opteron 280	2.4 GHz/DC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-82U	1 x Opteron 250	2.6 GHz/SC	2GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-92U	1 x Opteron 254	2.8 GHz/SC	2GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
Positioning Processor(s) L2/L3 Cache SMP support Implementation	Ultra-dense, low power, full performance modular computing platform with superior performance Up to 2 x AMD® Opteron / 280 Dual Core 2.4GHz / 254 Single Core 2.8GHz / simultaneously supports 32-bit and 64-bit computing 1MB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O 2-way SMP / up to two Opteron processors (same speed/cache size) Server blade contains two AMD 940 micro PGA ZIF sockets, four memory DIMM slots, two SCSI connectors, Myrinet and InfiniBand expansion card support, integrated graphics and dual ethernet									
Memory	1 or 2GB std / 16GB max ¹³ / two slots used / two slots available PC3200 266MHz registered 184-pin ECC DDR VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)									
IDE controller/bays SCSI disk controller	None One integrated / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B / on planar / supports RAID-1 mirroring [Embedded Mirroring] with two non-hot-swap 2.5" / small form factor (SFF) drives / one 16-bit internal channel / no cables or external connector)									
SCSI disk bays	Supports max of two not hot-swap 2.5" SL Ultra320 SCSI disks 40-pin SCA-2 connectors / all SCSI bays Ultra320-enabled									
Other controllers External storage	Support for SFF or legacy Ethernet or Fibre Channel I/O cards, Myrinet or InfiniBand Expansion cards Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)									
Mechanical Architecture / chipsets	Supported in IBM BladeCenter / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products AMD 8131 PCI-X Bridge Chip providing two PCI-X buses running at 600Mhz (bus A for SCSI and Ethernet, bus B for PCI-X expansion slots) / AMD 8111 HyperTransport Bridge Chip supporting a 200 Mhz double-pumped HyperTransport clock (PCI, SMBus, USB, LPC to BIOS and Super I/O) / National Semiconductor® PC87417 Super I/O chip									
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)									
Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full-duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Passthrough Module</i> (the second controller requires a second optional switch or PM)									
Network-interface	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release ²⁰									
DVD / diskette / USB Kybd / video / mouse Graphics	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon Mobility 7000M / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	IBM integrated system management processor (ISMP) / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module									
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)									
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode									
Software ship group	Documentation CD, IBM Director CD, Device Driver CD									
Cooling fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel									
Power supply Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system									
									Low Power Opteron 250 Processor Upgrade	25R8892
									Low Power Opteron 252 Processor Upgrade	25R8893
									Low Power Opteron 254 Processor Upgrade	25R8937
									Low Power Opteron 270 Processor Upgrade	25R8894
									Low Power Opteron 275 Processor Upgrade	25R8895
									Low Power Opteron 280 Processor Upgrade	25R8896
									2GB (2x1GB kit) DDR-SDRAM VLP RDIMM	39M5849
									4GB (2x2GB kit) DDR-SDRAM VLP RDIMM	39M5852
									8GB (2x4GB kit) DDR-SDRAM VLP RDIMM	41Y2756
									IBM 36.4GB SFF Non-hot-swap 10K SCSI HD	40K1037
									IBM 73.4GB SFF Non-hot-swap 10K SCSI HD	40K1038
									AMD Opteron LS20 Low Profile Handle	25R7748
									BladeCenter SCSI Storage Exp Unit	26K4817
									IBM SFF Fibre Channel Expansion Card	26K4841
									IBM SFF Gigabit Ethernet Expansion Card	26K4842
									IBM HS20 Fibre Channel Expansion Card	48P7061
	Other options at ibm.com/pc/us/accessories									

Server blade
(side view)



Bay ① 2.5", 9.5mm, no front access, optional SFF SCSI disk
Bay ② 2.5", 9.5mm, no front access, optional SFF SCSI disk

- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6";
H 24.5cm x W 2.9cm x D 44.6cm
- 11 lbs; 5.0kg (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 LS20 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 LS20 blade server¹³:
146GB with two 73.4GB SFF SCSI disks

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

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

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 time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 41C5906)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 41C5907)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 41C5908)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 41C5909)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 41C5910)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 41C5911)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8720-1RX	All: HS20/HS40/JS20/JS21/LS20	0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U ⁴ rack	Jul 2004
8720-2RX	All: HS20/HS40/JS20/JS21/LS20	0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U rack	Mar 2006
Positioning Description	Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (combo CD/DVD drive, and ports for USB, keyboard, video, mouse)									
Blade bays	Supports all blades HS20/HS40/JS20/JS21/LS20 and PCI I/O Expansion Blades / 8 hot-pluggable server bays / front access									
Switch modules	Std: none; max: four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru									
Advanced Management Module	Std: none; max: two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers									
Power modules	Std: two in bays 1 and 2, max: four / hot-swap / front access / input voltage range -48V - 60V (Min/Max) at 50/60Hz / two IEC320 C14 male appliance connector / 1300 watts / two std modules (in slots 1 & 2) supply power to switch bays 1 & 2, both management modules, blade bays 1 - 4 and media tray; two additional power modules provide full system redundant power and power to switch bays 3 & 4, and blade bays 5 - 8 All: load balancing / voltage-sensing / auto-restart									
Blower modules	Std: four; max: four / Calibrated Vecteded Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake									
Mechanical Optical / USB	EIA 19" rack models (8U⁴) x 20" deep / designed for EIA-310D and UTF Four Post Racks 24X-10X-24X-8X ⁶ Combo / Two USB port (Version 1.1) / all USB interface (types A & C) / front access / shared by up to eight blade servers / requests for optical cd and USB port(s) by pressing CD select button on server blade front panel									
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel									
Ports	Rear: keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / DB-15 Telco Alarm Panel Front: two USB (Version 1.1) /									
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures									
Ethernet	Each of the dual integrated gigabit ethernet controllers on each blade servers connects to an optional 4-port GB Ethernet Switch Module									
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software									
System LED panel	System LED panel provides power-on, location, critical, major and minor alarm conditions									

IBM BladeCenter T Advanced Management Module	32R0835	IBM 1300W DC Power Supply Module (x2)	32R0835
McData EFCM Element Managerfor BladeCenter	32R1799	IBM APC Smart-UPS 5000RMB (208V)	37L6861
IBM BladeCenter HS20 Low Profile Handle (800Mhz blade)	25K8360	IBM T115 15" Flat Panel Color Monitor (black)	494215U
IBM BladeCenter HS40 Low Profile Handle	25K8359	BladeCenter PCI I/O Expansion Unit II	25K8373
IBM BladeCenter T Filter	25K8376	IBM DS4000 EXP700 Fibre Channel Expansion Unit	17001RS
NetBAY42 Enterprise Rack Cabinet	930842S	IBM USB Floppy Drive	05K9276
Four Post Rack Mount Kit	32R0837		
Two Post Rack Mount Kit	32R0836		
		• Other options at ibm.com/pc/us/accessories	
		• Solutions available from IBM BladeCenter Alliance program partners	

Front

Rear

- ⊘ Dimensions: H13.76"(8U) x W17.4" x D20"(front bezel to rear I/O); H349.5mm x W441.9mm x D508mm
- ⊘ Weight: 98 to 192 lb; 44.5 to 87.38kg
- ⊘ Stealth black color bezel
- ⊘ Tool-free customer serviceability
- ⊘ Access server blades, power supplies, mgmt modules, media tray and expansion units from front
- ⊘ Access switch modules and blowers from rear
- ⊘ Fits into Standard Central Office environments
- ⊘ Air Intake Filtering
- ⊘ Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

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

LIMITED WARRANTY³

- ⊘ 3 year parts and labor
- ⊘ International Warranty Service³
- ⊘ 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 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9205)
- ⊘ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊘ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information
US models announced March 16, 2004

• = Hot-swap

IBM BladeCenter® T 8730 (AC power)

xREF by eServer Field Skills and Education Team

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8730-1RX All: HS20/HS40/JS20/JS21/LS20		0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U ⁴ rack	Jul 2004
8730-2RX All: HS20/HS40/JS20/JS21/LS20		0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U rack	Mar 2006
Positioning Description	Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (combo CD-RW/DVD and ports for USB, keyboard, video, mouse)									
Blade bays	Supports all blades HS20/HS40/JS20/JS21/LS20 and PCI I/O Expansion Units / 8 hot-pluggable server bays / front access									
Switch modules	Std: none; max: four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru									
Advanced Management Module	Std: none; max: two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers									
Management Modules	Std: one; max: two / hot-swap / rear access (I/O ports) / comprehensive system management functions / PowerPC® 401 controller / communicates with integrated system management processor on each server blade / multiplexor for console connectivity / controls external Telco alarm panel / ports: DB-15 analog video port, PS/2 keyboard port, PS/2 mouse port, 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers									
Power modules	Std: two in bays 1 and 2, max: four / hot-swap / front access / input voltage range 180VAC - 264VAC (Min/Max) at 50/60Hz / two IEC320 C14 male appliance connector / 1300 watts / two std modules (in slots 1 & 2) supply power to switch bays 1 & 2, both management modules, blade bays 1 - 4 and media tray; two additional power modules provide full system redundant power and power to switch bays 3 & 4, and blade bays 5 - 8 All: load balancing / voltage-sensing / auto-restart									
Blower modules	Std: four; max: four / Calibrated Vektored Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake									
Mechanical Optical / USB	EIA 19" rack models (8U⁴) x 20" deep / designed for EIA-310D (types A & C) and UTF four post racks 24X-10X-24X-8X ⁶ Combo / Two USB port (Version 1.1) / all USB interface / front access / shared by up to eight blade servers / requests for optical CD, and USB port(s) by pressing CD select button on blade server front panel									
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel									
Ports	Rear: keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / DB15 Telco Alarm Panel Front: Two USB (Version 1.1)									
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures									
Ethernet	Each of the dual integrated gigabit ethernet controllers on each blade server connects to an optional <i>GB Ethernet Switch Module</i>									
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software									
System LED panel	System LED panel provides power-on, location, critical, major and minor alarm conditions									
IBM BladeCenter T Advanced Management Module	32R0835	IBM 1300W AC Power Supply Module (x2)	32R0834							
McData EFCM Element Managerfor BladeCenter	32R1799	IBM APC Smart-UPS 5000RMB (208V)	37L6861							
IBM BladeCenter HS20 Low Profile Handle (800Mhz blade)	25K8360	IBM T115 15" Flat Panel Color Monitor (black)	494215U							
IBM BladeCenter HS40 Low Profile Handle	25K8359	BladeCenter PCI I/O Expansion Unit	25K8373							
IBM BladeCenter T Filter	25K8376	IBM DS4000 EXP700 Fibre Channel Expansion Unit	17001RS							
NetBAY42 Enterprise Rack Cabinet	930842S	IBM USB Floppy Drive	05K9276							
Four Post Rack Mount Kit	32R0837									
Two Post Rack Mount Kit	32R0836									
				<ul style="list-style-type: none"> • Other options at ibm.com/products/us • Solutions available from IBM BladeCenter Alliance program partners 						

Front

Rear

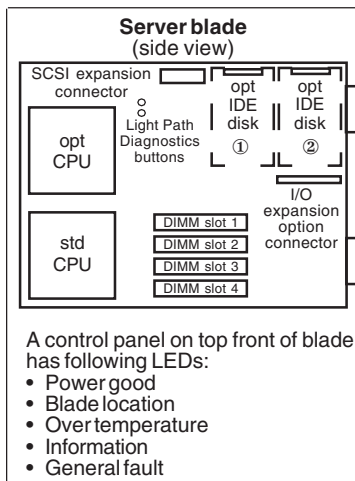
Bay	Switch function
1	Ethernet link 1 for all blade servers
2	Ethernet link 2 for all blade servers
3	Network connection 1 for all blade server I/O expansion options (Gb Ethernet/Fibre)
4	Network connection 2 for all blade server I/O expansion options (Gb Ethernet/Fibre)

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 time⁷**
- ↔ **On site service upgrade options (in eligible locations):⁷**
 - **3 year IOR 24x7, 2 hr avg response** (ServicePac® part num 21P2065)
 - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 30L9185)
 - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41L2736)
 - **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9207)
 - **5 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9205)
- ↔ **Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↔ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

IBM® Type-model	Qty x Processor ¹	Memory	Frontside Bus Mhz	L3 Cache	Disk	Disk controller	Disk bays	SCSI support with optional stor exp unit	Slots x bays	Mech-anical	Required chassis	Available date
8832-GTX	1 x Xeon 3.2GHz	1GB	533Mhz	2MB	None	EIDE	2 fixed	2 HS Ultra320	0x2	8U ⁴ blade	BladeCenter T	Feb 2004
8832-9TX	1 x Xeon 2.4GHz	1GB	533Mhz	2MB	None	EIDE	2 fixed	2 HS Ultra320	0x2	8U ⁴ blade	BladeCenter T	Feb 2004

Positioning Processor(s) L2/L3 Cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior performance</i> 1 x Intel® Xeon 2.5 HGz or 3.2GHz with 533MHz frontside bus / Hyper-Threading technology / NetBurst™ architecture 512KB L2 Cache / 0 - 2MB L3 Cache / on die of processor / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) Server blade contains two Intel 604-pin micro-PGA ZIF sockets, four memory DIMM slots, two IDE connectors, one SCSI expansion connector, one I/O expansion option connector, and integrated graphics and dual ethernet	
Memory	1GB std / 8GB max ¹³ / two slots used / two slots available / PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)	
IDE controller/bays	Enhanced IDE ATA-100 controller in CSB6-U South Bridge / two connectors/buses on planar / each supports one 2.5" IDE disk / no cable as IDE disk attaches to riser card and tray (included with option kit) / Supports max of two IDE disks / space for only one IDE disk if an I/O expansion option installed [Fibre Channel] / RAID-1 mirroring standard	
SCSI disk controller	None / supports optional SCSI Storage Expansion Unit (a blade occupying adjacent blade slot / connects to HS20 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports RAID-1 mirroring [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)	
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / all SCSI bays Ultra320-enabled	
External storage	Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)	
Mechanical Architecture / chipsets	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC LE Host Bridge (memory controller and I/O Bridge) / single slot one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip	
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)	
Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Optical Passthrough Module</i> (the second controller requires a second optional switch or OPM)	
Network-interface	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release ²⁰	
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel	
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel	
Graphics	SVGA / ATI® Rage XL / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus	
Systems mgmt	IBM integrated system management processor (ISMP) / HS2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module	Xeon 3.2Ghz/512KB L2 / 1MB L3 Cache Proc Upg 13N0650
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5038 1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5039 2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5040 IBM HS20 SCSI Storage Expansion Unit (blade) 48P7058 IBM HS20 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module) 48P7061 IBM HS20 40GB ² 5400 rpm ATA-100 HDD 48P7063 36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD* 06P5768 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* 06P5776 73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* 06P5756 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD* 32P0728 * Disk requires SCSI Storage Expansion Unit
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD	
Cooling fans	Uses cooling from BladeCenter (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel	
Power supply	Uses power module(s) in BladeCenter (type 8677)	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system	



- Bay ① 3.5", 9.5mm, no front access, optional ThinkPad® IDE disk
 - Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk
 - Stealth black front bezel
 - H 9.7" x W 1.14" x D 17.6"
 - H 24.5cm x W 2.9cm x D 44.6cm
 - 12 lbs; 5.4kg (max configuration)
 - Configuration/Setup Utility: F1 at startup
 - Diagnostics (PC-Doctor™): F2 at startup
 - System Partition Boot: ALT+F1 at startup
 - Network Boot: F12 at startup
 - PXE Boot Agent Utility: Ctrl+S at startup
 - Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
 - Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director
- Maximum internal disk capacity for each HS20 blade server¹³:*
80GB with two 40GB EIDE disks or
293.6GB* with two 146.8GB SL SCSI disks

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 time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
 - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

See footnotes for important warranty information
US model announced February 17, 2004

IBM eServer BladeCenter™ HS20 Low Profile Handle

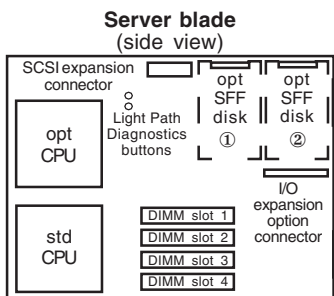
(8843) January 2005

xREF by eServer Field Skills and Education Team

IBM® Type-GAV	Processor	GHz¹	L2 cache	FSB MHz	Memory	Disk controller	Disk controller	Diskbays	SCSI Support with optional stor exp unit	slots x bays	Mechanical	Ethernet	Available date			
8843-LTy	1 x Xeon™	2.8	Low Volt	1MB	800	512MB	None	Ultra320	2-fixed	2	Hot-swap	Ultra320	0 x 2	7U⁴ blade	2 x Gigabit	Feb 2005
8843-4Ty	1 x Xeon	3.6GHz		1MB	800	1GB	None	Ultra320	2-fixed	2	Hot-swap	Ultra320	0 x 2	7U⁴ blade	2 x Gigabit	Feb 2005

Processor(s)	1 x Intel® Xeon 2.8 Low Voltage or 3.6 GHz with 800MHz frontside bus (FSB) / EM64T / 1MB L2 ECC Cache / Hyper-Threading technology / Low Voltage Processors reduce heat output for increased rack density without increased cooling capacity																																										
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 1MB std and max / at processor speed																																										
Memory	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet																																										
SCSI disk controller	512MB/1GB std / 8GB¹³ max / two slots used / two slots available / PC2-3200 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel /																																										
SCSI Disk bays	LSI Logic® 53C1020 SCSI controller / Single channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-1 & 1E mirroring (supported in 32-bit legacy mode only) / One 16-bit channel (one internal) / Internal channel: one 2-drop 16-bit 68-pin LVD SCSI cable																																										
External Storage	Two 2.5-inch Small Form Factor (SFF) Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; all SCSI bays Ultra320-enabled) / Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)																																										
Mechanical Architecture/Chipset	7U Blade / Supported in IBM BladeCenter T 8720-1XX or 8730-1XX																																										
BUS slots	Intel E7520 chipset / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface																																										
Ethernet	No PCI or PCI-X slots (expansion via modules or network-interface option connector)																																										
Network Interface	Dual gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM)																																										
CD / Diskette / USB Kybd / video / mouse Graphics controller	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release²⁰																																										
Systems Mgmt	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel																																										
Diagnostics	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel																																										
Security	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector																																										
Software ship group	IBM Baseboard Management Controller (BMC) / H8S2168 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module																																										
Cooling Fans	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																																										
Power supply(s) Prerequisites	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																																										
	Documentation CD, Broadcom CD																																										
	Uses cooling from BladeCenter T (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel																																										
	Uses power module(s) in BladeCenter T (type 8720/30)																																										
	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system																																										
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Other options at ibm.com/pc/us/accessories																																											

Bay ① 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk
 Bay ② 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk



- A control panel on top front of blade has following LEDs:
- Power good
 - Blade location
 - Over temperature
 - 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: 146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 146GB for total of 438GB)

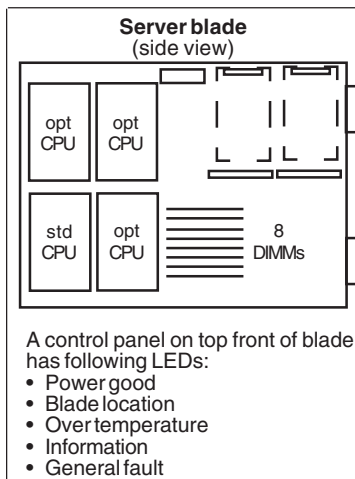
LIMITED WARRANTY³

- ⇒ 3 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
 - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9523)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

IBM® Type-model	Qty x Processor ¹	L3 Cache Memory	Frontside Bus Mhz	Disk controller	Disk bays	SCSI support with optional exp. unit	Slots x bays	Mechanical	Required chassis	Available date
8839-6TX	1 x Xeon™ 2.8GHz MP	2MB 2GB	400Mhz	None	None	None	2 H-S Ultra320	0x2 8U ⁴ blade	BladeCenter T	Mar 2004

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> Up to 1 x Intel® Xeon 2.8GHz MP with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture 512KB L2 Cache / 2MB L3 Cache / on die of processor / at processor speed 4-way SMP / up to four Xeon MP Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, four memory DIMM slots, one SCSI expansion connector, two I/O expansion option connector, integrated graphics and four ethernet ports									
Memory	2GB std / 16GB max ¹³ / two slots used / six slots available / eight total slots PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed									
SCSI disk controller	None / supports optional SCSI Storage Expansion Unit (a blade occupying adjacent blade slot / connects to HS20 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports RAID-1 mirroring [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)									
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / all SCSI bays Ultra320-enabled									
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)									
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products ServerWorks® Grand Champion™ 4.0 LE / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) /									
Architecture / chipsets	one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip									
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)									
Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional 4-port GB Ethernet Switch Module (the second controller requires a second optional Ethernet Switch Module)									
Network-interface	Two connectors for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release ²⁰									
CD / diskette / USB Kybd / video / mouse Graphics	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	Intel integrated Baseboard Management Controller (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module									
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)									
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode									
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD									
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel									
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system									
	Xeon 2.8Ghz/2MB L3 Cache Proc Upg 13N0653 512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5038 1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5039 2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM 33L5040 IBM HS40 SCSI Storage Expansion Unit (blade) 26K4847 IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module) 48P7061 IBM HS40 40GB ² 5400 rpm ATA-100 HDD 48P7063 36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD* 06P5768 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* 06P5776 73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* 06P5756 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD* 32P0728 * Disk requires SCSI Storage Expansion Unit									



- ▷ Stealth black front bezel
 - ▷ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
 - ▷ 12 lbs; 5.4kg (max configuration)
 - ▷ Configuration/Setup Utility: F1 at startup
 - ▷ Diagnostics (PC-Doctor™): F2 at startup
 - ▷ System Partition Boot: ALT+F1 at startup
 - ▷ Network Boot: F12 at startup
 - ▷ PXE Boot Agent Utility: Ctrl+S at startup
 - ▷ Blade control panel on each HS40 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
 - ▷ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director
- Maximum internal disk capacity for each HS40 blade server¹³: 293.6GB* with two 146.8GB SL SCSI disks*

LIMITED WARRANTY³

- ↪ 3 year parts and labor
- ↪ International Warranty Service³
- ↪ 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 24x7, 2 hr avg response (ServicePac® part num 69P9519)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
- ↪ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

See footnotes for important warranty information
US models announced February 17, 2004

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.

¹ MHz/GHz only measures microprocessor internal clock speed; many factors affect application performance.

² 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.

³ 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.

⁴ 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.

⁶ CD and DVD drives speeds are variable and are often less than the maximum.

⁷ 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.

⁹ Some software may differ from retail version (if any) and may not include user manuals or all program functionality. Software license agreements may apply.

¹⁰ Updated drivers and hot-swap services for certain operating systems may be required to support PCI hot-swap functions.

¹¹ Fire GL1, Fire GL2 and Fire GL4 are trademarks of ATI Technologies, Inc., and are used under license.

¹² Installation of 2GB RDIMMs requires BIOS and diagnostic firmware version 1.08 or later. When more than 8GB of memory is installed, the integrated SCSI controller must be disabled.

¹³ Maximum memory and internal hard disk capacities may require the replacement of standard component with largest supported component available.

¹⁴ Response times may vary. May exclude some holidays. Telephone support may be subject to additional charges.

¹⁵ IBM makes no representations or warranties regarding non-IBM products and services that are ServerProven, including but not limited to the implied warranties of merchantability and fitness for particular purpose. These products are offered and warranted by third parties, not IBM.

¹⁶ Asset ID allows your computer to be scanned by various radio frequency emitting devices which must be purchased separately from independent companies.

¹⁷ 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.

¹⁸ Diskettes and hard copy documentation available at extra charge.

¹⁹ For combination drives, maximum possible speeds only are given in the following order: CD read, CD write, CD re-write, DVD read.

²⁰ Statement of direction and subject to availability.

²¹ Max physical memory is currently 16GB contingent on general availability of 4GB memory DIMMs, running under select 64-bit Linux distributions; addressable capacity is less. Under select 32-bit Linux distributions, maximum physical memory is 16GB contingent on general availability of 4GB memory modules, with a maximum of 3GB allocated per thread. Maximum physical memory is 4GB running under Microsoft Windows XP Professional operating system; addressable capacity is less.

²² 16GB Memory max with PC2700 DIMMs, 8GB Max with PC3200 DIMMs



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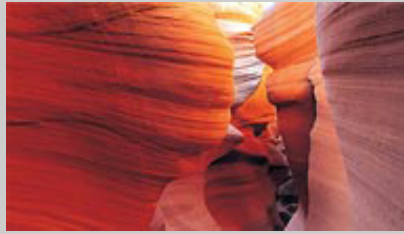
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