

IBM STG Field Skills Education

System x Reference (xREF)



System x Reference (xREF)

including

IBM™

System x™ / xSeries™ / BladeCenter™

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This document is available at:
<http://www-1.ibm.com/servers/eserver/education/cust/xseries/xref.html>

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 *Some: CD-ROM: 48X-20X⁶ CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X⁶ / None standard*
 Ports *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

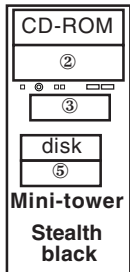
Graphics controller AT® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024 x 768 x 32 bit @85Hz

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

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)

- 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
 - IBM 500GB SATA-150 (7.2K) simple-swap HDD 39M4514
 - 48X/32X/48X/16X Max⁶ 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



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

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) *Uniprocessor, entry server designed to meet small business needs and budgets*
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)
 L2 cache **1 or 2MB** std on Pentium 4 / **4MB** 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 **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

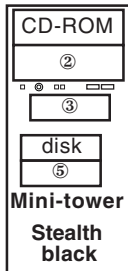
Rack support None
 Bus slots (see below) One PCI Express® bus / one 64-bit PCIe™ x8 slot / one 64-bit PCIe x1 / two 32-bit 33MHz 5v PCI 2.2 slots
 Chipset **Intel E7230 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-7) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / 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 *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 @100Hz

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 IBM 500GB SATA-150 (7.2K) simple-swap HDD 48X/32X/48X/16X Max ⁶ 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 Other options at ibm.com/pc/us/accessories	30R5148 30R5149 30R5150 39M4500 39M4504 39M4508 39M4514 32R2905 32R2906 40K1692 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 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 - ELX		Pentium® 4 631	3.0GHz/SC	2MB	800	1 x 512MB	160GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006
8486 - EMX		Pentium 4 631	3.0GHz/SC	2MB	800	1 x 512MB	80GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006
8486 - ENX		Pentium 4 651	3.4GHz/SC	2MB	800	1 x 512MB	80GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006
8486 - E8X		Pentium D 930	3.0GHz/DC	4MB	800	2 x 512MB	80GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006

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 up to 3.0GHz Dual-Core 800MHz FSB / Intel Celeron D 2.66GHz 533MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **1 or 2MB** std on Pentium 4 / **4MB** 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 **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 80 or 160GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
 RAID Controller None standard / ServeRAID 7i 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®

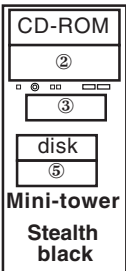
CD-ROM / diskette *Some: CD-ROM: 48X-20X® CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X® / None standard*
 Ports *Front: two USB (Ver 2.0); Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)*

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

Graphics controller **ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024 x 768 x 32 bit @100Hz**

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 IBM 500GB 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-7i SATA Controller IBM Ultra320 SCSI Controller2 Other options at ibm.com/pc/us/accessories	30R5148 30R5149 30R5150 39M4500 39M4504 39M4508 39M4514 32R2905 32R2906 40K1692 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 17.24" x W 8.07" x D 19.57"
- ✦ H 438mm x W 205mm x D 497mm
- ✦ 30.86 to 37.48 pounds (14 to 17kg)
- ✦ BTU Output:
 - Minimum: 326 Btu/hr (96 watts)
 - Maximum: 1024 Btu/hr (300 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 41W9316)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41W9317)
 - 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

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 ¹	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	256MB	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	6 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	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	70y-70x	Pentium D 820 2.8GHz	2x1MB	800	1GB	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	512MB	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	1GB	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	512MB	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

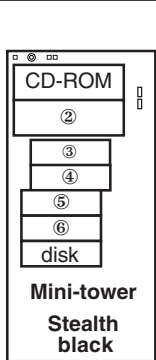
SAS disk controller Integrated SAS controller / supports SAS or SATA drives
 IDE disk controller Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
 SATA disk controller Four channel SATA controller (3.0GB/sec) / supports 4 drives standard
 Cables One 2-drop EIDE cables (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 ServeRAID™ 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), **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)
 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
 IBM 500GB SATA (7.2K) simple-swap HDD
 80GB Hot-Swap SATA HDD
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 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 ServeRAID-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)

- ✦ 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:
 2TB¹³ (4 disks x 500GB)
 Maximum hot-swap SAS capacity:
 1.2TB¹³ (4 disks x 300GB)

- ✦ 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

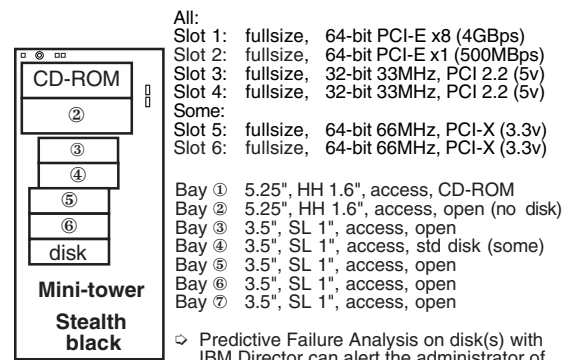
LIMITED WARRANTY³

- ✦ 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

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	6 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	6 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	6 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 Ports	CD-ROM: 48X-20X ⁶ 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), 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)											

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
IBM 500GB SATA (7.2K) simple-swap HDD	39M4514
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	40K1039
146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
48X/32X/48X/16X Max ⁸ CD-RW/DVD-ROM Combo (black)	32R2905
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 5Ux20D Tower-to-Rack Kit	39R9361
IBM ServeRAID-7i SATA Integrated Controller	71P8648
Other options at ibm.com/pc/us/accessories	



- 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
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- 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)
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- 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

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	B4y-B4x	Pentium® 4 631 3.0GHz	2MB	800	1x512MB	1x160GB/SATA	2.0TB	4 x 7	4	simple-swap	1x400W Gigabit	May 2006
8485/8490	B6y-B6x	Pentium 4 631 3.0GHz	2MB	800	2x512MB	2x160GB/SATA	2.0TB	4 x 7	4	simple-swap	1x400W Gigabit	May 2006
8485/8490	F2y-F2x	Pentium 4 661 3.6GHz	2MB	800	1x512MB	None/SATA	2.0TB	4 x 7	4	simple-swap	1x400W Gigabit	May 2006
8485/8490	F4y-F4x	Pentium 4 661 3.6GHz	2MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4	hot-swap	1x400W Gigabit	May 2006
8485/8490	H4y-H4x	Pentium D 930 3.0GHz	4MB	800	2x512MB	2x250GB/SATA	2.0TB	4 x 7	4	simple-swap	1x400W Gigabit	May 2006
8485/8490	H6y-H6x	Pentium D 930 3.0GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4	hot-swap	2x430W Gigabit	May 2006
8485/8490	H8y-H8x	Pentium D 930 3.0GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4	hot-swap	2x430W Gigabit	May 2006
8485/8490	K2y-K2x	Pentium D 950 3.4GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4	hot-swap	2x430W Gigabit	May 2006

Positioning Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*
Intel® Pentium 4 up to 3.6GHz Single-Core 800MHz FSB / Pentium D up to 3.4GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **2MB** std on Pentium 4 / **4MB** 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: 160GB SATA; some: 250GB 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 5U⁴ 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 / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse

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 CD-ROM / diskette *CD-ROM: 48X-20X⁶ 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*
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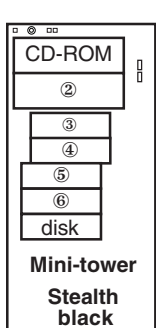
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Keyboard / mouse Optional
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 - Bay ⑥ 3.5", SL 1", access, open
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- ◇ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator 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
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 - ◇ H 448mm x W 215.9mm x D 539.75mm
 - ◇ 36 to 45.8 pounds (16.3 to 20.8kg)
- Maximum SATA capacity:
 2TB¹³ (4 disks x 500GB)
 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
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 - 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® Machine Type	Machine 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	14U	Pentium® 4 531 3.0GHz ¹	1MB	800	1x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Sep 2006
8485/8490	16U	Pentium 4 531 3.0GHz	1MB	800	1x512MB	1x160GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Sep 2006
8485/8490	72U	Pentium D 820 2.8GHz	2MB	800	1x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Sep 2006
8485/8490	74U	Pentium D 820 2.8GHz	2MB	800	2x512MB	2x250GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Sep 2006
8485/8490	JAU	Pentium D 945 3.4GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Sep 2006

Positioning Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*
Intel® Pentium 4 up to 3.0GHz Single-Core 800MHz FSB / Pentium D up to 3.4GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **1MB** std on Pentium 4 / **2 or 4MB** 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: 160GB SATA; some: 250GB 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 5U⁴ 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 / 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®
 Optical / diskette *Some: 48X-20X⁶ CD-ROM, IDE; Some: 48X-32X-48X-16X⁶ CD-RW/DVD-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**

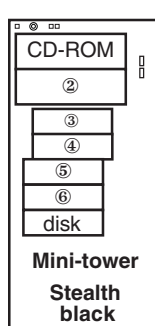
Graphics controller AT® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

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

- 30R5148
- 30R5149
- 30R5150
- 30R5150
- 39M4500
- 39M4504
- 39M4508
- 39M4514
- 39M4518
- 39M4522
- 39M4526
- 40K1039
- 40K1040
- 40K1041
- 40K1042
- 40K1043
- 32R2905
- 59P2984
- 39R9361
- 71P8648

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)

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



- 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

- ✦ 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:
 2TB¹³ (4 disks x 500GB)
 Maximum hot-swap SAS capacity:
 1.2TB¹³ (4 disks x 300GB)

- ✦ 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

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® Type-model	Processor	GHz¹	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	36.4GB² 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	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	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	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	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	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	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)

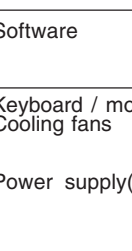
Graphics controller SVGA / ATI® RageXL / on Mini PCI adapter / 8MB SDRAM std and max / PCI 2.2 32-bit 33MHz / analog 15-pin D-Sub conn

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)
 Xeon 2.67 GHz/533/512KB L2 Cache Proc Upg 24P7861
 Xeon 2.80 GHz/533/512KB L2 Cache Proc Upg 24P8054
 Xeon 3.06 GHz/533/512KB L2 Cache Proc Upg 24P8122
 2x256MB PC2100 CL2.5 ECC non-Chipkill DIMM Kit 73P2868
 512MB PC2100 CL2.5 ECC DDR-SDRAM 33L5038
 1GB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5039
 2GB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5040
 IBM 73.4GB 10K Ultra320 SCSI 68-pin (not hot-swp) 32P0724
 IBM 146GB 10K Ultra320 SCSI 68-pin (not hot-swp) 32P0725
 IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD 06P5776
 IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD 32P0727
 IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD 32P0728
 40X/12X/40X Max⁶ CD-RW internal (black) 22P6976
 IBM Remote Supervisor Adapter II (PCI adapter) 59P2984
 IBM 4U Extended Depth Tower-to-Rack Kit 59P4817
 IBM ServeRAID-5i Controller (adapter for Slot 4) 25P3492
 IBM ServeRAID-6i Controller (adapter for Slot 4) 71P8595
 Other options at ibm.com/pc/us/accessories

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 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)

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 ⑥ 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

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-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 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 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 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 Ports **CD-ROM: 48X-20X 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

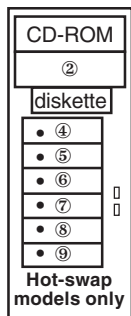
Security Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Xeon 2.8 GHz/800/2MB L2 Cache EM64TProc Upg 40K2500
Xeon 3.0 GHz/800/2MB 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

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

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

Power supply(s) **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 ⑨ 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)

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

- ✦ 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-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
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) 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-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 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 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 Ports **CD-ROM: 48X-20X⁶ 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**

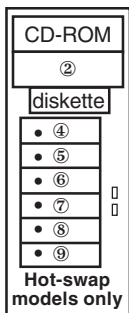
Security Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)

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

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+



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-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)

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

- ◇ 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) *Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
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

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)

SCSI channels Two 16-bit channels / **SCSI Channel A:** 16-bit 68-pin LVD cable from controller to backplane; **Channel B:** 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)

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 (5U⁴) 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-20X⁶ CD-ROM / IDE / 1.6" HH; **Diskette:** 3.5" 1.44MB diskette drive / dust cover
Rear ports Rear: 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 Front: one USB (Vers 1.1); **Graphics:** SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus

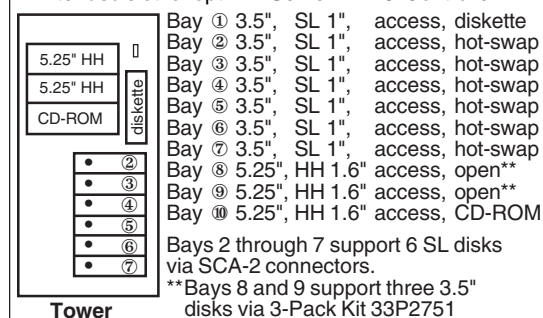
Security Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot

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)
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 **MAX:** std/max: two/two 660 watt *All:* voltage-sensing / auto-restart / fan in each
M7X: std/max: one/two 660 watt
xAX: std/max: two/two 560 watt
Rest: std/max: one/two 560 watt
Fans Four fans and two blowers / variable speed / hot-swap / redundant / PFA / fan in each power supply

Xeon 2.67GHz/512KB L2 Cache Proc Upg	71P8966
Xeon 2.8BGHz/512KB L2 Cache Proc Upg	71P8967
Xeon 3.06GHz/512KB L2 Cache Proc Upg	02R1988
2x256MB PC2100 Non-Chipkill DDR-SDRAM Kit	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
IBM ServeRAID-6i Controller (adapter for slot 4)	71P8595
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
36.4GB 15K-2 80 Ultra320 SCSI Hot-Swap SL HDD	06P5776
3-Pack Ultra320 Hot-Swap Expansion Kit	33P2751
IBM 560W Hot-Swap Power Upgrade Kit*	02R1874
IBM 660W Hot-Swap Power Upgrade Kit (3.06 Only)	02R2015
*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



- 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
8841-0RU-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	<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 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 / <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	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); <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									
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									
						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				

<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 style="text-align: center;">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 ➤ 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 <p style="text-align: center;">All models: Max int disk capacity: 1.8TB² with six 300GB Ultra160 or Ultra320 SCSI hot-swap slimline HDDs</p>	<p style="text-align: center;">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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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 / 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 (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	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	<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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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

Light Path Diag **7U⁴ Rack or Tower**

Removable Processor Board Tray

• Opt disk	• Opt disk	Floppy Drive	
• Opt disk	• Opt disk	CD-ROM	
• Opt disk	• Opt disk	Full High Tape Bay	
• Opt disk	• Opt disk	or 2 Half High 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

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

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

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 *A highly affordable, uni-processor, 1U rack-optimized server*
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 max¹³ / 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 *SCSI models:* **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 *SCSI models:* On adapter: one 68-pin SCSI connector
IDE disk controller Enhanced IDE busmaster / ATA-100 support / two connectors on systemboard
Cables *SCSI models:* one 2-drop 16-bit LVD SCSI cable, one 1-drop 40-conductor EIDE cable (connected to CD-ROM)
EIDE models: one 2-drop EIDE cable (to CD-ROM and disk), one 1-drop EIDE cable (to second disk bay)
Disk - features *SCSI:* 18.2GB/36.4GB Ultra160 SCSI, 10K rpm, 5.2ms read seek; *EIDE:* 40GB ATA-100, 7200 rpm, 8.7ms read; *All:* 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

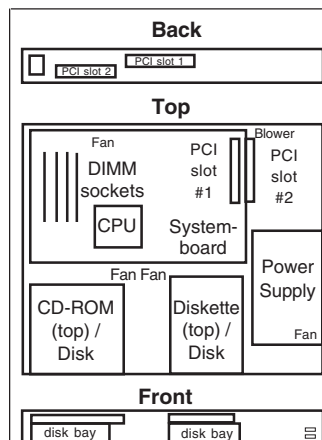
Ethernet controllers Two gigabit 10/100/1000 ethernet ports / Broadcom® BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / PXE / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM / diskette 24X-10X⁶ CD-ROM / IDE; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports *Rear:* serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port
Front ports / graphics *Front:* two USB (Vers 1.1); *Graphics:* SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
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 DIMM 33L5037
 - 512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM 33L5038
 - 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
- * Disk not supported in all x305 systems



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

Bay ① 3.5", UltraSlim 0.5", access, std diskette
 Bay ② 5.25", UltraSlim 0.5", access, std CD-ROM
 Bay ③ 3.5", SL 1", no access, std fixed disk
 Bay ④ 3.5", SL 1", no access, open for fixed disk

- ⊕ Raven black front bezel
- ⊕ H 1.72" (1U) x W 17.3" x D 16.75"; 43.7mm x 439.9mm x 425.5mm
- ⊕ 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
- ⊕ Configuration/Setup Utility: F1 at startup
- ⊕ Optional System Partition: ALT+F1 at startup
- ⊕ Network Boot: F12 at startup
- ⊕ Operator Information Panel in front
- ⊕ SCSISelect near startup by pressing CTRL+A (SCSI models)
- ⊕ Ships with Diagnostics CD, ServerGuide Setup and Installation CD, and IBM Director CD, and Broadcom Ethernet CD
- ⊕ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity¹³ (model dependent):
 146.8GB with two 73.4GB SL SCSI disks or
 240GB with two 120GB EIDE disks / supports 15K rpm SCSI 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
 - 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

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**

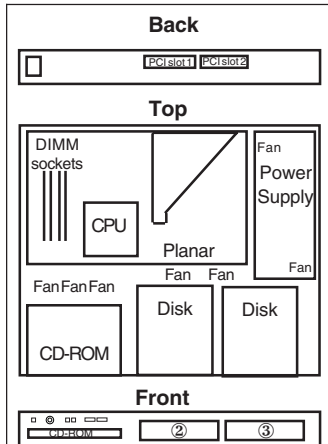
Software **ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™ and others**

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

LIMITED WARRANTY³

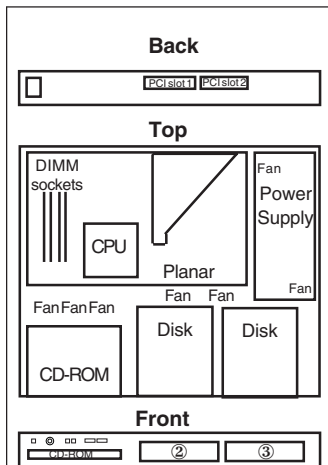
- ❖ 1 year parts and labor standard 8849 MTM
- ❖ 3 year parts and labor standard 8491 MTM
- ❖ International Warranty Service³
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD avg response (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

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	B2y-B2x	Pentium® 4 631 3.0GHz	2MB	800	512MB	SATA	2 simple-swap	1U ⁴ rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8491	G2y-G2x	Pentium D 920 2.8GHz	4MB	800	1GB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8491	G4y-G4x	Pentium D 920 2.8GHz	4MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8491	H2y-H2x	Pentium D 930 3.0GHz	4MB	800	1GB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8491	H4y-H4x	Pentium D 930 3.0GHz	4MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Feb 2006
8849/8491	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 / 8GB ¹³ 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 (1U ⁴) / rack-mount only Intel E7230 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-10X ⁶ 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											

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

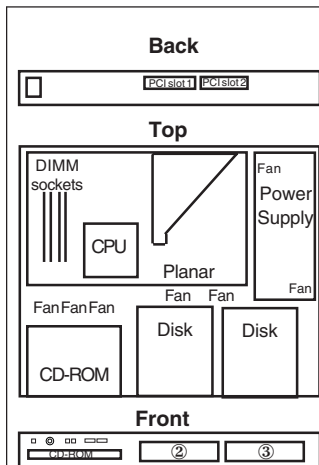
See footnotes for important warranty information

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	K2y-K2x	Pentium® D 950	3.4GHz/DC	4MB	800	2 x 512MB	SATA	2 simple-swap	1U ⁴ rack	2x3	Dual GB	1/3yr	May 2006
8849/8491	K4y-K4x	Pentium D 950	3.4GHz/DC	4MB	800	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	May 2006
8849/8491	94y-94x	Pentium D 960	3.6GHz/DC	4MB	800	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	May 2006

Positioning	<i>A highly affordable, uni-processor, 1U rack-optimized server</i>											
Processor(s)	Intel® Pentium D up to 3.6GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)											
L2 cache	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	1GB std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / two sockets 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 E7230 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-10X ⁶ CD-ROM Slim/ IDE; <i>Diskette</i> : 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											

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)
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 - ❖ 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

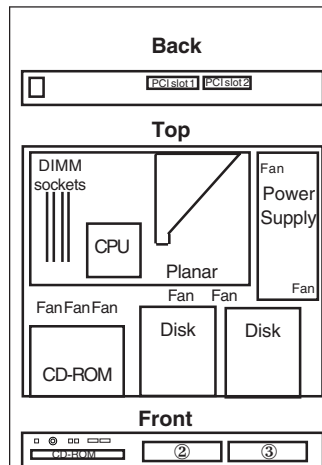
- ❖ 1 year parts and labor standard 8849 MTM
- ❖ 3 year parts and labor standard 8491 MTM
- ❖ International Warranty Service³
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD avg response (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

IBM® Machine Type model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr ³	Available date
8849/8491 FAU	Pentium® D 915 2.8GHz/DC	4MB	800	2 x 512MB	SATA	2 simple-swap	1U ⁴ rack	2x3	Dual GB	1/3yr	Sep 2006
8849/8491 JAU	Pentium D 945 3.4GHz/DC	4MB	800	2 x 512MB	SATA	2 simple-swap	1U rack	2x3	Dual GB	1/3yr	Sep 2006
8849/8491 JBX	Pentium D 945 3.4GHz/DC	4MB	800	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	Sep 2006

Positioning	<i>A highly affordable, uni-processor, 1U rack-optimized server</i>										
Processor(s)	Intel® Pentium D up to 3.4GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)										
L2 cache	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	1GB std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / two sockets 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 E7230 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-10X ⁶ CD-ROM Slim/ IDE; <i>Diskette</i> : none										
Rear ports	<i>Rear</i> : serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)										
Front ports / Graphics	<i>Front</i> : 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	40K1039
146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
146GB 15K 3.5" SAS Hot-Swap HDD	40K1044
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

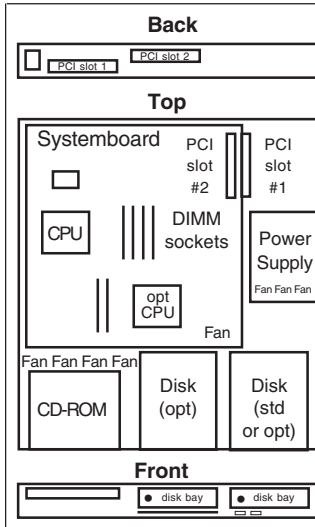
LIMITED WARRANTY³

- ❖ 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

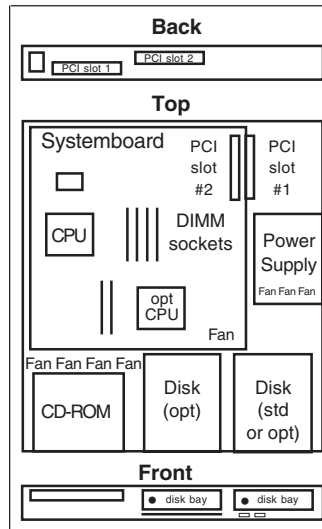
LIMITED WARRANTY³

- 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
• = Hot-swap in some models
US models announced August 5, 2003

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

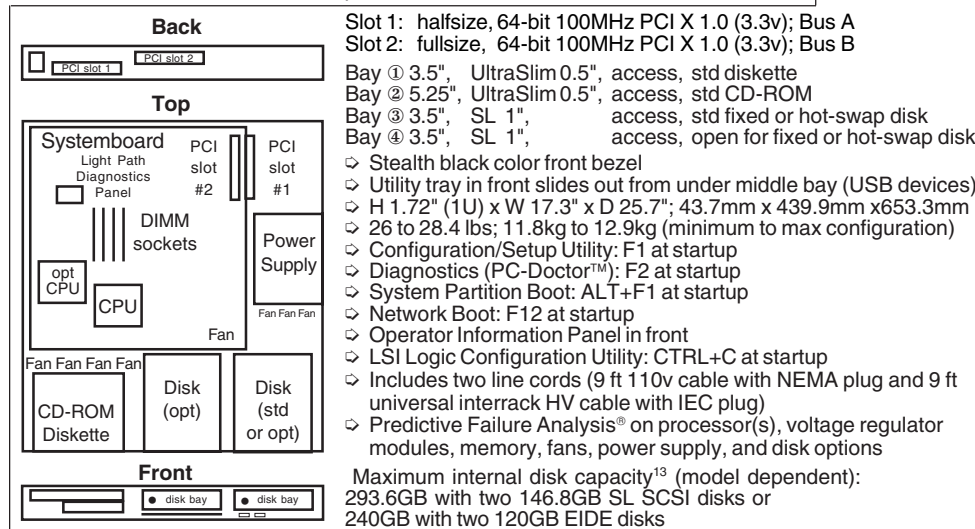
- 1 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9399)
 - 2 year IOR 24x7, 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-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="0"> <thead> <tr> <th></th> <th style="text-align: center;">OPTIONS</th> <th></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 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

See footnotes for important warranty information

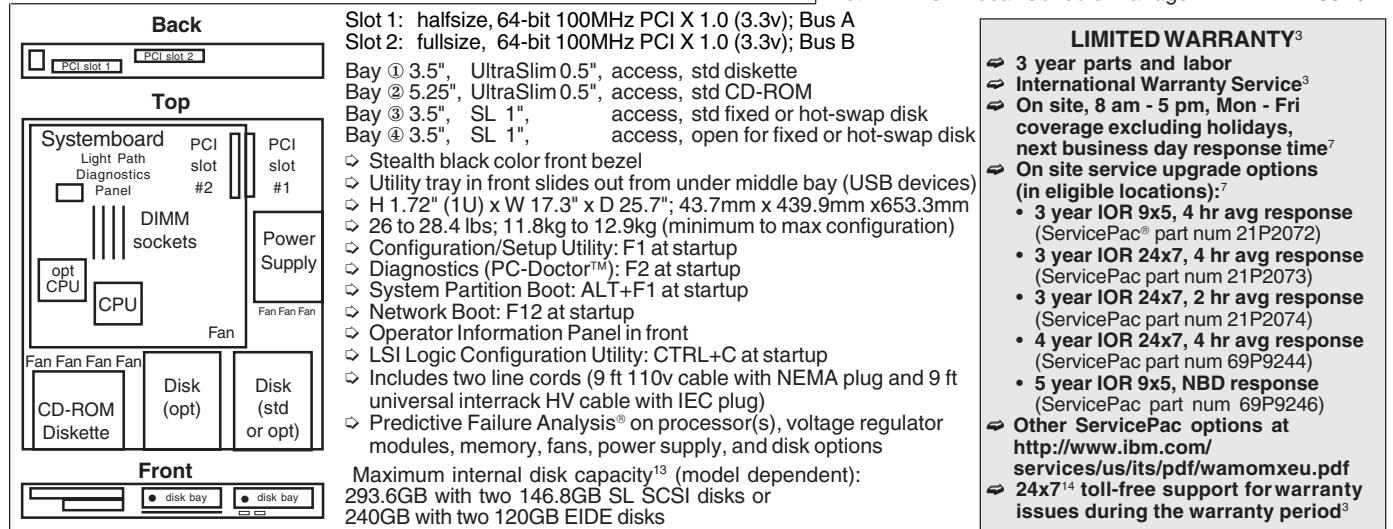
• = Hot-swap

© 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 style="text-align: center;">OPTIONS</th> <th></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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- 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	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 (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											
PCI bus 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>CD-ROM</p> <p>diskette</p> <p>disk bay</p> <p>disk bay</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>	<ul style="list-style-type: none"> ➤ 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 3.5" x W 17.5" x D 20.0" ➤ H 89 mm x W 445 mm x D 508 mm ➤ 34 to 37 pounds (15.4 to 16.8 kg) ➤ IPMI 1.5 and WfM 2.0-compliant 	<p>LIMITED WARRANTY³</p> <ul style="list-style-type: none"> ↔ 1 year parts and labor ↔ International Warranty Service³ ↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷ ↔ 1 year on site warranty service upgrade options (in eligible locations):⁷ <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) ↔ 24x7¹⁴ toll-free support for warranty issues during the warranty period³
<p>All models: Max int disk capacity: 72.8GB² with two 36.4GB SL disks</p>			

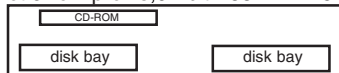
See footnotes for important warranty information
US model announced March 19, 2002

IBM® Type-model	Qty x Processor	L2 cache Memory	Ultra320 SCSI disk	SCSI controller	Mech- anical	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

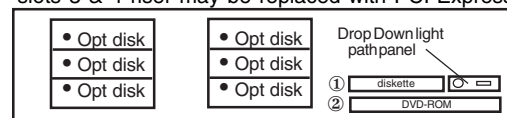
US model announced June 15, 2004

≈ 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				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											
				All models: Max int disk capacity: 880.0GB ² with six 146.8GB SL 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
- 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



- 2U Rack**
- 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) via SCA-2 connectors

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)									
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others									
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					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				
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					Other options at ibm.com/pc/us/accessories				
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>	<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 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
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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 (3U ⁴) 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										
Six available 3.3 volt Active PCI-X slots:											
<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 											
<ul style="list-style-type: none"> ◇ 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>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>											
<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 											

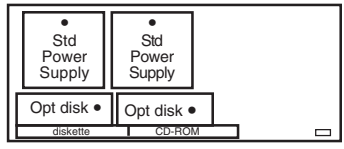
See footnotes for important warranty information • = Hot-swap
US models announced June 30, 2003 or November 11, 2003 (1SQ, 1TQ)
⊃ US models withdrawn effective December 30, 2003 (1SQ, 1TQ)

IBM @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 ⁸ 5704 10/100/1000 ethernet controller / on I/O Board / full duplex / 64-bit 66MHz PCI bus / Wake on LAN ⁹ SVGA / ATI ⁷ Rage XL / on I/O Board / 8MB SDRAM std/max / up to 1280x1024 at 85Hz.											
Ports	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 4816DBX Microsoft Windows Server Datacenter 2003 1GB DDR PC2100 ECC SDRAM RDIMM 33L5039 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

IBM® Machine Type	Model	Proces-	Speed ¹ /Core	L2 Cache	Memory	Disk	Disk controller	Maximum Capacity	Optical	Slots x bays	Hard disk bays	Ethernet	Available date
4347 - 22U	Athlon® 3500+		2.2GHz/SC	512KB	1 x 512MB	80GB	SATA	1.5 TB	CD-ROM	4 x 5	2 fixed	Gigabit	Oct 2006
4347 - 42U	Opteron® 1210		1.8GHz/DC	2x1MB	1 x 512MB	80GB	SATA	1.5 TB	CD-ROM	4 x 5	2 fixed	Gigabit	Oct 2006
4347 - 44U	Opteron 1210		1.8GHz/DC	2x1MB	2 x 512MB	160GB	SATA	1.5 TB	CD-ROM	4 x 5	2 fixed	Gigabit	Oct 2006
4347 - 64U	Opteron 1214		2.2GHz/DC	2x1MB	2 x 512MB	160GB	SATA	1.5 TB	Combo	4 x 5	2 fixed	Gigabit	Oct 2006
4347 - 26U	Athlon 3500+		2.2GHz/SC	512KB	1 x 512MB	160GB	SATA	1.5 TB	CD-ROM	4 x 5	2 fixed	Gigabit	May 2007
4347 - 48U	Opteron 1210		1.8GHz/DC	2x1MB	2 x 512MB	160GB	SATA	1.5 TB	CD-ROM	4 x 5	2 fixed	Gigabit	May 2007
4347 - 82U	Opteron 1218		2.6GHz/DC	2x1MB	2 x 512MB	250GB	SATA	1.5 TB	Combo	4 x 5	2 fixed	Gigabit	June 2007

Positioning Processor(s) *Uniprocessor, entry server designed to meet small business needs and budgets*
 Single-socket AMD® Opteron 1000 Series Dual-Core processor up to 2.6GHz or one Athlon up to 2.2GHz Single-Core

L2 cache Implementation **2MB** std on Opteron / **512KB** std on Athlon / ECC / full speed
 Motherboard contains one AM2 socket, four DIMM sockets, four slots(2 PCI Express x8, 2 PCI), 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 / **PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)** / dual-channel / industry std / unbuffered

SCSI disk controller None standard / Ultra320 SCSI controller 2 (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) / integrated into I/O Controller Hub / supports up to two HDDs & one GoVault™ drive standard

Cables One 2-drop EIDE cable (to optical drive) / one 1-drop SATA cable per installed hard disk
 Disk 80, 160 or 250GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
 RAID Controller None standard / IBM SAS HBA Controller optional for RAID 0 & 1

Rack support None
 Bus slots (see below) Two PCI-E x8 slots / two 32-bit 33MHz 5v PCI 2.2 slots

Chipset **Nvidia® nForce™ Professional 2200 MCP** / I/O Controller Hub provides: two PCI-Express x8 slots, two PCI 2.2 slots, ATA-100 EIDE, SATA, USB, Low Pin Count Interface / SST 49LF004A, 4Mbit Firmware Hub / Winbond® PC8374K Super I/O for diskette, parallel, serial

Ethernet 10/100/1000 gigabit / Broadcom 5721 / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
 Optical / diskette Ports *Some: CD-ROM: 48X-20X⁶ CD-ROM, IDE; some: CDRW/DVD-ROM Combo: 48X/32X/48X/16X⁶, IDE*
Front: two USB(2.0); Back: one serial(9-pin), one parallel, four USB(2.0), ethernet(RJ-45), video(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 ATI® ES1000 / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024 x 768 x 32 bit @85Hz

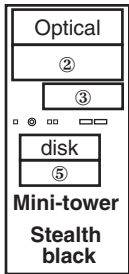
Security Optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse/display

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

Keyboard / mouse Included / USB only
 Cooling fans Three variable speed fans (cpu heatsink, front, 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)

- 512MB PC2-5300 CL5 ECC DDR2 41Y2726
- 2x1GB PC2-5300 CL5 ECC DDR2 41Y2729
- 2x2GB PC2-5300 CL5 ECC DDR2 41Y2732
- IBM 160GB SATA-150 (7.2K) simple-swap HDD 39M4504
- IBM 250GB SATA-150 (7.2K) simple-swap HDD 39M4508
- IBM 500GB SATA-150 (7.2K) simple-swap HDD 39M4514
- IBM 750GB SATA-150 (7.2K) simple-swap HDD 43W7572
- IBM 48x-20x CD-Rom Internal IDE Drive (black) 39M6342
- 16x Max RAM-Read DVD-Rom Black Drive 22P1999
- 48x/32x/48x/16x Max⁶ CD-RW/DVD (black) 32R2905
- IBM Multi-burner Plus 32R2906
- IBM USB Portable Diskette Drive 40K1692
- IBM GoVault 80GB (SATA) 25R0006
- IBM 160/320GB VXA-3 Tape Drive (SCSI) 25R0045
- IBM DDS/5 Tape Drive (SCSI) 39M5656
- IBM ServeRAID 7t SATA Controller 39R8805
- IBM SAS HBA Controller (for SATA RAID 0, 1) 25R8060
- IBM Ultra320 SCSI Controller 2 39R8743

Other options at ibm.com/products/us



- Bay ① 5.25", HH 1.6", access, optical
- Bay ② 5.25", HH 1.6", access, open (optical or tape)
- 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, PCI-E x8 (4GBps)
- Slot 2: fullsize, PCI-E x8 (4GBps)
- 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 17.2" x W 8.1" x D 19.6"
- ◇ H 438mm x W 205mm x D 497mm
- ◇ 31 to 38 pounds (14 to 17kg)
- ◇ Maximum internal disk capacity¹³: 1.5TB with two 750GB SATA disks

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

IBM® Machine Type	model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	slots x bays	Hard disk bays	Power Supply	Ethernet	Available date		
4362/4363	22Y/2BY	Pentium® D 915	3.0GHz ¹	2x2MB	800	1x512MB	None/SATA	2.0TB	5 x 7	4 simple-swap	1x400W	Gigabit	Nov 2006	
4362/4363	24Y/2DY	Pentium D 915	3.0GHz	2x2MB	800	2x512MB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	1x400W	Gigabit	Nov 2006	
4362/4363	32Y/3BY	Pentium D 945	3.4GHz	2x2MB	800	1x512MB	None/SATA	2.0TB	5 x 7	4 simple-swap	1x400W	Gigabit	Nov 2006	
4362/4363	42Y/4BY	Xeon®	3040	1.86GHz	2MB	1066	1x512MB	None/SATA	2.0TB	5 x 7	4 simple-swap	1x400W	Gigabit	Nov 2006
4362/4363	43Y/4CY	Xeon	3040	1.86GHz	2MB	1066	2x512MB	1x160GB/SATA	2.0TB	5 x 7	4 simple-swap	1x400W	Gigabit	Nov 2006
4362/4363	44Y/4DY	Xeon	3040	1.86GHz	2MB	1066	2x512MB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	1x400W	Gigabit	Nov 2006
4362/4363	52Y/5BY	Xeon	3050	2.13GHz	2MB	1066	2x512MB	None/SATA	2.0TB	5 x 7	4 simple-swap	1x400W	Gigabit	Nov 2006
4362/4363	56Y/5FY	Xeon	3050	2.13GHz	2MB	1066	2x512MB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	2x430W	Gigabit	Nov 2006
4362/4363	57Y/5GY	Xeon	3050	2.13GHz	2MB	1066	2x512MB	1x160GB/SATA	2.0TB	5 x 7	4 hot-swap	2x430W	Gigabit	Nov 2006
4362/4363	62Y/6BY	Xeon	3060	2.4GHz	4MB	1066	2x512MB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	1x400W	Gigabit	Nov 2006
4362/4363	64Y/6DY	Xeon	3060	2.4GHz	4MB	1066	2x512MB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	2x430W	Gigabit	Nov 2006

Positioning Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*
Intel® Pentium D up to 3.4GHz 800MHz FSB / Xeon up to 2.4GHz 1066 MHz FSB / All Dual-Core / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache Implementation **1MB** per core std on Pentium D / **2 or 4MB** std on Xeon
 SMP support Motherboard contains one LGA-775 socket, four DIMM sockets, two PCI Express slots, three PCI slots, SAS/SATA support, ATI video and Gigabit Ethernet.
 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 / **PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

SAS/SATA controller **LSI Logic® 1064e** / daughter card / supports SAS or SATA drives / four-port / PCI-Express / **RAID 0,1**
 IDE controller Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
 SATA controller Four channel SATA controller (3.0GB/sec) / supports 4 drives standard / integrated
 Cables One 2-drop EIDE cables (to optical) / one 1-drop SATA cable per installed hard disk
 Disk Some: 160GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.

Rack support 5U⁴ rack mount support via tower-to-rack kit option
 Bus slots (see below) One PCI-E x8 / one PCI-E x1 / three 32-bit 33MHz 5v PCI 2.2 slots

Chipset **Intel 3010 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® SCH5017** 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®
 Optical / diskette 4362 MTMs: 48X-20X⁶ CD-ROM, IDE; 4363 MTMs: 48X-32X-48X-16X⁶ CD-RW/DVD-ROM, IDE / None standard
 Ports Front: two USB (2.0); Rear: two serial (9-pin), parallel, four USB (2.0), keyboard, mouse, ethernet (RJ45) and video
 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® ES1000(RN50) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Security Chassis intrusion detection / mechanical side panel key lock / U-Bolt Tie-down capability/power-on password / boot sequence control / operation without kybd/mouse
 Software **ServerGuide™** (CD-based automated network OS installation and configuration tool), 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)

- 41Y2726
- 41Y2729
- 41Y2732
- 39M4500
- 39M4504
- 39M4508
- 39M4514
- 39M4518
- 39M4522
- 39M4526
- 39M4530
- 40K1039
- 40K1040
- 40K1041
- 40K1042
- 40K1043
- 40K1044
- 32R2906
- 39Y9566
- 42C8923
- 42C1312

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

Bay ① 5.25", HH 1.6", access, optical
 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 56 pounds (16.3 to 25.2kg)

Maximum SATA capacity:
 2TB¹³ (4 disks x 500GB)
 Maximum hot-swap SAS capacity:
 1.2TB¹³ (4 disks x 300GB)

LIMITED WARRANTY³
 ➤ 1 year parts and labor standard 4362 MTM
 ➤ 3 year parts and labor standard 4363 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® Machine Type	model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	slots x bays	Hard disk bays	Power Supply	Ethernet	Available date
4362/4363	12Y/1BY	Pentium® 4 541 3.2GHz¹	1MB	800	1x512MB	None/SATA	2.0TB	5 x 7	4 simple-swap	1x400W	Gb	Feb 2007
4362/4363	14Y/1DY	Pentium 4 541 3.2GHz	1MB	800	1x512MB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	1x400W	Gb	Feb 2007
4362/4363	72Y/7BY	Xeon® 3210 2.13GHz	8MB	1066	2x1GB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	1x400W	Gb	Feb 2007
4362/4363	74Y/7DY	Xeon 3210 2.13GHz	8MB	1066	2x1GB	None/SAS/SATA	2.0TB	5 x 7	4 hot-swap	2x430W	Gb	Feb 2007

Positioning Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*
Intel® Processor 4 up to 3.2GHz 800MHz FSB / Xeon up to 2.13GHz 1066 MHz FSB / Dual-Core / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **1MB** per std on Pentium 4 / **8MB** std on Xeon
 Implementation Motherboard contains one LGA-775 socket, four DIMM sockets, two PCI Express slots, three PCI slots, SAS/SATA support, ATI video and Gigabit Ethernet.
 SMP support No SMP support / no processor upgrade

Memory **512MB or 2GB** std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

SAS/SATA controller **LSI Logic® 1064e** / daughter card / supports SAS or SATA drives / four-port / PCI-Express / **RAID 0,1**
 IDE controller Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
 SATA controller Four channel SATA controller (3.0GB/sec) / supports 4 drives standard / integrated
 Cables One 2-drop EIDE cables (to optical) / one 1-drop SATA cable per installed hard disk
 Disk Some: 160GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.

Rack support 5U⁴ rack mount support via tower-to-rack kit option
 Bus slots (see below) One PCI-E x8 / one PCI-E x1 / three 32-bit 33MHz 5v PCI 2.2 slots

Chipset **Intel 3010 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® SCH5017** Super I/O for diskette, parallel, serial, keyboard, mouse

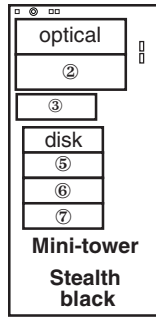
Ethernet 10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers /
 Preboot eXecution Environment (PXE) / Wake on LAN®
 Optical / diskette **4362 MTMs: 48X-20X⁶ CD-ROM, IDE; 4363 MTMs: 48X-32X-48X-16X⁶ CD-RW/DVD-ROM, IDE / None standard**
 Ports *Front:* two USB (2.0); *Rear:* two serial (9-pin), parallel, four USB (2.0), keyboard, mouse, ethernet (RJ45) and video
 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® ES1000(RN50) / 16MB SDRAM** std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Security Chassis intrusion detection / mechanical side panel key lock / U-Bolt Tie-down capability/power-on password / boot sequence control / operation without kybd/mouse
 Software **ServerGuide™** (CD-based automated network OS installation and configuration tool), 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)

- 41Y2726
- 41Y2729
- 41Y2732
- 39M4500
- 39M4504
- 39M4508
- 39M4514
- 39M4518
- 39M4522
- 39M4526
- 39M4530
- 40K1039
- 40K1040
- 40K1041
- 40K1042
- 40K1043
- 40K1044
- 32P2906
- 39Y9566
- 42C8923
- 42C1312



- Slot 1: fullsize, PCI-E x8 (4GBps)
- Slot 2: fullsize, PCI-E x1 (500MBps)
- Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
- Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
- Slot 5: fullsize, 32-bit 33MHz, PCI 2.2 (5v)
- Bay ① 5.25", HH 1.6", access, optical
- 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 56 pounds (16.3 to 25.2kg)
- Maximum SATA capacity: 2TB¹³ (4 disks x 500GB)
- Maximum hot-swap SAS capacity: 1.2TB¹³ (4 disks x 300GB)

LIMITED WARRANTY³

- 1 year parts and labor standard 4362 MTM
- 3 year parts and labor standard 4363 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® Machine Type model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr ³	Available date
4364/4365 12Y/1BY	Celeron® D 341	2.93GHz/DC	256KB	533 1 x 512MB	SATA	2 simple-swap	1U ⁴ rack	2x3	Dual GB	1/3yr	Nov 2006
4364/4365 22Y/2BY	Pentium® D 945	3.4GHz/DC	2x2MB	800 1 x 512MB	SATA	2 simple-swap	1U rack	2x3	Dual GB	1/3yr	Nov 2006
4364/4365 42Y/4BY	Xeon® 3040	1.87GHz/DC	2MB	1066 2 x 512MB	SATA	2 simple-swap	1U rack	2x3	Dual GB	1/3yr	Nov 2006
4364/4365 44Y/4DY	Xeon 3040	1.87GHz/DC	2MB	1066 2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	Nov 2006
4364/4365 52Y/5BY	Xeon 3050	2.13GHz/DC	2MB	1066 2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	Nov 2006
4364/4365 54Y/5DY	Xeon 3050	2.13GHz/DC	2MB	1066 2 x 512MB	SAS	4 hot-swap	1U rack	2x5	Dual GB	1/3yr	Nov 2006
4364/4365 62Y/6BY	Xeon 3060	2.4GHz/DC	4MB	1066 2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	Nov 2006
4364/4365 64Y/6DY	Xeon 3060	2.4GHz/DC	4MB	1066 2 x 512MB	SAS	4 hot-swap	1U rack	2x5	Dual GB	1/3yr	Nov 2006

Positioning Processor(s) *Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure*
Intel® Celeron at 2.93GHz 533 FSB / Pentium D at 3.4GHz Dual-Core 800MHz FSB / Xeon up to 2.4GHz Dual-Core 1066MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **256KB** std on Celeron / **2x2MB** std on Pentium D / **2 or 4MB** on Xeon / 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 PCI Express® x8 slots

Memory **512MB or 1GB** std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / two sockets used / **PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

SAS/SATA controller **LSI Logic® 1064e** / daughter card / supports SAS or SATA drives / four-port / PCI-Express / **RAID 0,1**
 SATA controller Four channel SATA controller (3.0GB/sec) / supports 2 drives standard / integrated into South Bridge
 IDE controller Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
 Cables **SAS models:** one 1-drop EIDE cable (connected to Optical)
SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to Optical)

Disk None standard
 Mechanical **EIA 22" Rack (1U⁴)** / rack-mount only
 Architecture / Intel **3010 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI-E, ATA-100 EIDE, ethernet chipsets
 Bus slots MAC, USB, Low Pin Count Interface / Firmware Hub / **SMSC® SCH5017** Super I/O for serial, keyboard, mouse (See below) two PCI-E™ x8

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)
 Optical / diskette **4364 MTMs:** 48X-20X⁶ CD-ROM, IDE; **4365 MTMs:** 48X-32X-48X-16X⁶ CD-RW/DVD-ROM, IDE / **Diskette:** none
 Ports **Front:** two USB (2.0) / **Rear:** serial (9-pin), two ethernet (RJ-45), keyboard, mouse, video (DB-15), two USB (2.0), one systems management (RJ-45)
 Graphics ATI® ES1000(RN50) / 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 slimline Remote Supervisor Adapter II with dedicated slot 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	512MB PC2-5300 ECC DDR2 2GB(2x1GB) PC2-5300 ECC DDR2 4GB(2x2GB) PC2-5300 ECC DDR2	41Y2726 41Y2729 41Y2732
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™ and others	IBM 36GB SFF SAS HDD IBM 73GB SFF SAS HDD IBM 80GB SATA (7.2K) simple-swap HDD IBM 160GB SATA (7.2K) simple-swap HDD IBM 250GB SATA (7.2K) simple-swap HDD IBM 500GB SATA (7.2K) simple-swap HDD	40K1051 40K1052 39M4500 39M4504 39M4508 39M4514
Cooling fans	Seven fans (five fans for system, two on power supply) / variable speed / not redundant or hot-swap	80GB Hot-Swap SATA HDD 160GB Hot-Swap SATA HDD	39M4518 39M4522
Power supply	351 watt / universal / auto-sensing / auto-restart support	250GB Hot-Swap SATA HDD 500GB Hot-Swap SATA HDD	39M4526 39M4530
Prerequisites	Monitor, keyboard, mouse, rack	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 146GB 15K 3.5" SAS Hot-Swap HDD IBM Remote Supervisor Adapter II slimline IBM Simple-Swap SATA RAID Kit	40K1039 40K1040 40K1041 40K1042 40K1043 40K1044 42C4178 42C1313

Rear

Slot 1: 3/4 length, full height, PCI-E x8
 Slot 2: half length, low-profile, PCI-E x8

Top

DIMM sockets, CPU, Planar, Fan, Power Supply, Fan, Fan, Fan, Fan, Fan, Disk, Disk, Optical

Front

Optical, ①, ②

or

①, ②, ③, ④

Some:

- Bay ① 3.5", SL 1", access, open for simple-swap/hot-swap disk
- Bay ② 3.5", SL 1", access, open for simple-swap/hot-swap disk
- Bay ③ 5.25", UltraSlim 0.5", access, std optical

Some:

- Bay ① 2.5", SFF, access, open for hot-swap disk
- Bay ② 2.5", SFF, access, open for hot-swap disk
- Bay ③ 2.5", SFF, access, open for hot-swap disk
- Bay ④ 2.5", SFF, access, open for hot-swap disk
- Bay ⑤ 5.25", UltraSlim 0.5", access, std optical

- ❖ Raven black front bezel
- ❖ H 1.75" (1U) x W 17.32" x D 22"; 43mm x 440mm x 559mm
- ❖ 24.4 to 28 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):
 1TB with two 500GB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks or 292GB with four 2.5" 73GB SAS disks

LIMITED WARRANTY³

- ❖ 1 year parts and labor standard 4364 MTM
- ❖ 3 year parts and labor standard 4365 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

IBM® Machine Type model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays Ethernet	Ltd warr ³	Available date
4364/4365 21Y/2AY	Pentium® D 925 3.0GHz/DC	2x2MB	800	1 x 512MB	SATA	2 simple-swap	1U ⁴ rack	2x3 Dual GB	1/3yr	Feb 2007
4364/4365 82Y/8BY	Xeon® 3210 2.13GHz/DC	8MB	1066	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3 Dual GB	1/3yr	Feb 2007
4364/4365 92Y/9BY	Xeon 3220 2.4GHz/DC	8MB	1066	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3 Dual GB	1/3yr	Feb 2007

Positioning Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure

Processor(s) Intel® Pentium D at 3.0GHz Dual-Core 800MHz FSB / Xeon up to 2.4GHz Dual-Core 1066MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)

L2 cache 2x2MB std on Pentium D / 8MB on Xeon / 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 PCI Express® x8 slots

Memory 512MB or 1GB std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / two sockets used / PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC) / DIMMs and ECC memory controller / industry std / unbuffered

SAS/SATA controller LSI Logic® 1064e / daughter card / supports SAS or SATA drives / four-port / PCI-Express / RAID 0,1

SATA controller Four channel SATA controller (3.0GB/sec) / supports 2 drives standard / integrated into South Bridge

IDE controller Enhanced IDE busmaster / ATA-100 support / one connector on systemboard

Cables SAS models: one 1-drop EIDE cable (connected to Optical)
SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to Optical)

Disk None standard

Mechanical Architecture / chipsets EIA 22" Rack (1U⁴) / rack-mount only

Bus slots Intel 3010 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI-E, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5017 Super I/O for serial, keyboard, mouse (See below) two PCI-E™ x8

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)

Optical / diskette Ports 4364 MTMs: 48X-20X⁶ CD-ROM, IDE; 4365 MTMs: 48X-32X-48X-16X⁶ CD-RW/DVD-ROM, IDE / Diskette: none

Ports Front: two USB (2.0) / Rear: serial (9-pin), two ethernet (RJ-45), keyboard, mouse, video (DB-15), two USB (2.0), one systems management (RJ-45)

Graphics ATI® ES1000(RN50) / 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 slimline Remote Supervisor Adapter II with dedicated slot 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	512MB PC2-5300 ECC DDR2 2GB(2x1GB) PC2-5300 ECC DDR2 4GB(2x2GB) PC2-5300 ECC DDR2	41Y2726 41Y2729 41Y2732
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™ and others	IBM 36GB SFF SAS HDD IBM 73GB SFF SAS HDD IBM 80GB SATA (7.2K) simple-swap HDD IBM 160GB SATA (7.2K) simple-swap HDD IBM 250GB SATA (7.2K) simple-swap HDD IBM 500GB SATA (7.2K) simple-swap HDD	40K1051 40K1052 39M4500 39M4504 39M4508 39M4514
Cooling fans	Seven fans (five fans for system, two on power supply) / variable speed / not redundant or hot-swap	80GB Hot-Swap SATA HDD 160GB Hot-Swap SATA HDD 250GB Hot-Swap SATA HDD 500GB Hot-Swap SATA HDD	39M4518 39M4522 39M4526 39M4530
Power supply	351 watt / universal / auto-sensing / auto-restart support	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 146GB 15K 3.5" SAS Hot-Swap HDD	40K1039 40K1040 40K1041 40K1042 40K1043 40K1044
Prerequisites	Monitor, keyboard, mouse, rack	IBM Remote Supervisor Adapter II slimline IBM Simple-Swap SATA RAID Kit	42C4178 42C1313

Rear

Slot 1: 3/4 length, full height, PCI-E x8
Slot 2: half length, low-profile, PCI-E x8

Top

Some:
Bay ① 3.5", SL 1", access, open for simple-swap/hot-swap disk
Bay ② 3.5", SL 1", access, open for simple-swap/hot-swap disk
Bay ③ 5.25", UltraSlim 0.5", access, std optical

Some:
Bay ① 2.5", SFF, access, open for hot-swap disk
Bay ② 2.5", SFF, access, open for hot-swap disk
Bay ③ 2.5", SFF, access, open for hot-swap disk
Bay ④ 2.5", SFF, access, open for hot-swap disk
Bay ⑤ 5.25", UltraSlim 0.5", access, std optical

Raven black front bezel
 H 1.75" (1U) x W 17.32" x D 22"; 43mm x 440mm x 559mm
 24.4 to 28 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):
1TB with two 500GB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks or 292GB with four 2.5" 73GB SAS disks

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

LIMITED WARRANTY³

- 1 year parts and labor standard 4364 MTM
- 3 year parts and labor standard 4365 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

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk controller	Mechanical	Slots x bays (std/max)	Warranty	Power supply	Ethernet	Available date
7973/74-42y-42x	1x Xeon™ 5110 1.6GHz	DC 4MB	1GB	Open SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7973/74-52y-52x	1x Xeon 5120 1.86GHz	DC 4MB	1GB	Open SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7973/74-62y-62x	1x Xeon 5130 2.0GHz	DC 4MB	1GB	Open SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7973/74-12y-12x	1x Xeon 5050 3.0GHz	DC 4MB	1GB	Open SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Sep 2006
7975/76-42y-42x	1x Xeon 5110 1.6GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-4Ay-4Ax	1x Xeon 5110 1.6GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Aug 2006
7975/76-52y-52x	1x Xeon 5120 1.86GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-5Ay-5Ax	1x Xeon 5120 1.86GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Aug 2006
7975/76-62y-62x	1x Xeon 5130 2.0GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-6Ay-6Ax	1x Xeon 5130 2.0GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Aug 2006
7975/76-14y-14x	1x Xeon 5050 3.0GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Sep 2006
7975/76-16y-16x	1x Xeon 5050 3.0GHz	DC 4MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Sep 2006
7975/76-B2y-B2x	1x Xeon E5310 1.6GHz	QC 8MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Dec 2006
7975/76-C2y-C2x	1x Xeon E5320 1.86GHz	QC 8MB	1GB	Open SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Dec 2006

Positioning Processor *Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
 Up to 1 x Intel® Xeon 3.0GHz with 667MHz FSB / 1 x Intel Xeon 1.86GHz with 1066MHz FSB / 1 x Intel Xeon 2.0GHz with 1333MHz FSB / 4MB L2 ECC Cache / Dual-Core / 1 x Intel Xeon 1.86GHz with 1066MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T

L2 cache 4 or 8MB / std and max / at processor speed

SMP support Implementation 2-way SMP / up to two Xeon Processors (same speed/cache size)
 Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers

Memory 1GB std / 32GB¹³ max / two slots used / six slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill

SAS/SATA controller MTs 7973/4: native SATA / on planar / PCI-Express / HostRAID 0 & 1 / MTs 7975/6: ServeRAID 8k-l std / Adaptec® AIC-9580W / eight port SAS(300MB/sec) or SATA(150MB/sec) / hot-swap / on planar / PCI-Express / RAID 0, 1 & 10

SAS connectors Dual channel controller wired to hot-swap DASD backplane

SAS cabling Mini SAS cable connects controller to 4-bay backplane

IDE controller / cable IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (CD-ROM)

Disk - capacity None std / supports 7200-15000 rpm disks / single backplane (upgradeable to dual backplanes)

Disk - bays Some: four hot-swap SAS/SATA bays (upgradeable to eight); some: four simple-swap SATA bays

Mechanical Tower / conversion to EIA 26" Rack (5U⁴) via optional kit 39Y8382

Slots (see below) Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot

Chipset Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O

Ethernet controller One 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-Express / full duplex / Wake on LAN® / IPMI (2.0)

CD-ROM / diskette 48X⁶ CD-ROM / IDE / 1.6" HH; *Diskette*: USB only

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

Front port / graphics Front: two USB (Vers 2.0); Graphics: X VGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2

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

Systems mgmt IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 H8S2166⁷ / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)

Diagnostics System error LED Panel in front

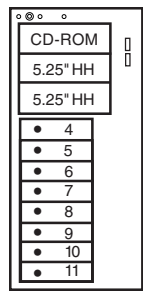
Software ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others

Keyboard / mouse Optional

Power supply Some: 670 watt / fixed / one std/max; some: 835 watt / hot-swap / one/two std/max / redundant with two; all: voltage-sensing / auto-restart std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply

Xeon 5050 3.0GHz/667MHz/4MB L2 Cache Proc Upg	25R8926
Xeon E5310 1.6GHz/1066MHz/8MB L2 Cache Proc Upg	43W5821
Xeon E5320 1.86GHz/1066MHz/8MB L2 Cache Proc Upg	43W5822
Xeon 5110 1.6GHz/1066MHz/4MB L2 Cache Proc Upg	40K1231
Xeon 5120 1.86GHz/1066MHz/4MB L2 Cache Proc Upg	40K1232
Xeon 5130 2.0GHz/1333MHz/4MB L2 Cache Proc Upg	40K1233
1GB Kit (2x512MB DIMM) PC2-5300 DDR2 FBD CL4	39M5782
2GB Kit (2x1GB DIMM) PC2-5300 DDR2 FBD CL4	39M5785
4GB Kit (2x2GB DIMM) PC2-5300 DDR2 FBD CL4	39M5791
73GB 10K SAS Hot-Swap HDD	40K1039
146GB 10K SAS Hot-Swap HDD	40K1040
300GB 10K SAS Hot-Swap HDD	40K1041
36GB 15K SAS Hot-Swap HDD	40K1042
73GB 15K SAS Hot-Swap HDD	40K1043
146GB 15K SAS Hot-Swap HDD	40K1044
500GB 7.2K SATA Hot-Swap HDD	39M4530
IBM Remote Supervisor Adapter II Slimline	39Y9566
IBM Redundant Power and Cooling Option(NA)	39Y8487

Other options at www.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 5.25", HH 1.6" access, open
Hot-Swap SAS/SATA models:
 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, open
 Bay 8 3.5", SL 1", access, open
 Bay 9 3.5", SL 1", access, open
 Bay 10 3.5", SL 1", access, open
 Bay 11 3.5", SL 1", access, open
Simple-Swap SATA models:
 Bay 8 3.5", SL 1", access, open
 Bay 9 3.5", SL 1", access, open
 Bay 10 3.5", SL 1", access, open
 Bay 11 3.5", SL 1", access, open

- ⇨ Quick release adapter slots (no screws)
- ⇨ Configuration/Setup Utility invoked by pressing F1 at startup
- ⇨ RAID Configuration Utility near startup by pressing CTRL+A
- ⇨ 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 17.3" x W 8.6" x D 29.4"
- ⇨ 42 to 84 pounds
- ⇨ Stealth black color

Slot 1: half-length, PCI-Express x8(x4 electrical)
 Slot 2: full, PCI-Express x8
 Slot 3: full, PCI-Express x8
 Slot 4: full, 64-bit 133MHz 3.3v PCI-X
 Slot 5: full, 64-bit 133MHz 3.3v PCI-X
 Slot 6: half-length, 32-bit 33MHz 5.0v PCI

Hot-Swap models: Max internal disk capacity: 2.4TB² with eight 300GB 10K SAS or 4.0TB² with eight 500GB SATA hot-swap HDDs

Simple-Swap models: Max internal disk capacity: 1.0TB² with four 250GB SATA non-hot-swap HDDs

LIMITED WARRANTY³

- ⇨ 1 yr parts and labor 7973/7975 MTM
- ⇨ 3 yr parts and labor 7974/7976 MTM
- ⇨ International Warranty Service³
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁴
- ⇨ 3 year on site warranty service upgrade options (ineligible 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	Speed/Core	L2 Cache	Optical	Memory	Disk / Controller	Disk bays	Slots x bays	Ethernet	Warranty ³ (years)	Available date
7984 - 11U	1 x Opteron™ 2210	1.8GHz/DC	2MB	Open	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 31U	1 x Opteron 2214	2.2GHz/DC	2MB	CD-RW/DVD	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 41U	1 x Opteron 2216	2.4GHz/DC	2MB	Open	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 51U	1 x Opteron 2218	2.6GHz/DC	2MB	Open	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 52U	2 x Opteron 2218	2.6GHz/DC	2MB	Open	4x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 6AU	2 x Opteron 2220SE	2.8GHz/DC	2MB	Open	4x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 6BU	1 x Opteron 2220	2.4GHz/DC	2MB	Open	2x1GB	2x73GB/SAS	2 fixed	2x3	Dual Gigabit	1	Nov 2006
7984 - 72U	1 x Opteron 2220	2.8GHz/DC	2MB	Open	2x512MB	160GB/SATA	2 fixed	2x3	Dual Gigabit	1	Apr 2007
7984 - 82U	2 x Opteron 2222SE	3.0GHz/DC	2MB	Open	4x512MB	160GB/SATA	2 fixed	2x3	Dual Gigabit	1	May 2007

Positioning Processor(s) Up to two AMD® Opteron 2000 Series Dual Core Processors up to 3.0GHz¹ / simultaneously supports 32-bit and 64-bit computing
L2 cache 1MB / per core / at processor speed / Dual Core Capable
SMP support Implementation 2-way SMP / up to two Opteron Processors (same speed/cache size required)
 Systemboard contains two LGA 1207-pin sockets, twelve memory DIMM slots, integrated SATA, dual ethernet, graphics, one PCI-E x16 slot and either one PCI-E x8 or one HTx slot

Memory 1 or 2 GB std / 24GB max¹³ per processor (48GB max per dual cpu system) / single cpu system: two slots used, four slots available; dual cpu system: four slots used, eight slots available / PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs / twelve DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / Error Checking and Correcting (ECC) via 16-bit Checksum / Xcelerated Memory Technology™ / Chipkill™ on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

SATA disk controller Integrated SATA II controller / provided by HT1000 South Bridge / two port / optional SAS / optional RAID
SATA controller/cable Two connectors on planar / two 1-drop cables / one 1-drop IDE cable (for optical drive)
Disk - capacity 80GB / 7200 rpm / 9.0ms seek
Disk - bays Two 3.5" fixed / SATA connectors / filler panels in each disk bay / supports 15k drives
Mechanical EIA 19" Rack (1U*) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products

Architecture/chipsets ServerWorks™ Chipset / HT2100 System I/O Controller provides: one PCI-Express x16 slot, one PCI-Express x8 or one HTx slot, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: PCI-X, USB(2.0), ATI video, SATA, Dual GB ethernet, IDE and LPC bus to NS PC87427 for Super I/O

Bus slots (See detail below) one half-length PCI-E x16 and one half-length PCI-E x8 / option to convert PCI-E x8 slot to HTx slot

Ethernet Two gigabit 10/100/1000 ethernet ports / Broadcom® 5704 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 133MHz / full duplex / Wake on LAN® / two rear RJ-45 ports

Optical / diskette Optional / IDE / Diskette none (USB diskette optional)
Rear ports Rear: four USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45), analog DB-15 graphics / parallel port not supported
Front ports Front: two USB (Vers 2.0)
Graphics SVGA / ATI® RN50b(ES1000) / on planar / 16MB SDRAM std/max
Keyboard / mouse None standard (because rack-based)

Security Power-on and administrator passwords / unattended boot / selectable boot
Systems mgmt IBM Integrated Baseboard Management Controller(BMC) / H82166 / IPMI 2.0

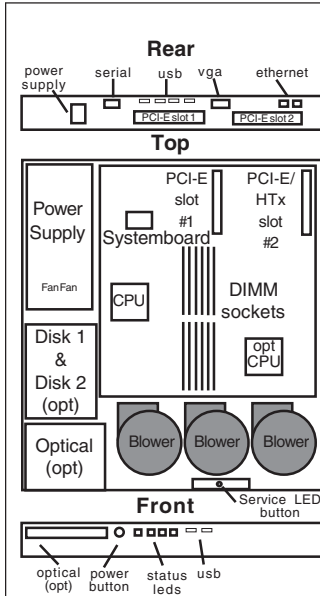
Diagnostics Diagnostic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported

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

Cooling Five fans total / three blowers for processors, memory and HDD bays / two fans inside power supply / Calibrated Vector Cooling™ / variable speed / not redundant / not hot-swap

Power supply 650 watt / universal / auto-sensing / auto-restart support
Prerequisites Monitor, keyboard, mouse, rack, os

Dual Core AMD Opteron Processor Model 2210	40K1208
Dual Core AMD Opteron Processor Model 2214	40K1215
Dual Core AMD Opteron Processor Model 2216	40K1210
Dual Core AMD Opteron Processor Model 2218	40K1211
Dual Core AMD Opteron Processor Model 2220	43W7265
Dual Core AMD Opteron Processor Model 2220SE	40K1209
Dual Core AMD Opteron Processor Model 2222SE	43W7266
1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2759
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2762
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2765
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2768
IBM 80GB 7.2K 3.5" SATA HDD	39M4500
IBM 160GB 7.2K 3.5" SATA HDD	39M4504
IBM 250GB 7.2K 3.5" SATA HDD	39M4508
IBM 500GB 7.2K 3.5" SATA HDD	39M4514
IBM 750GB 7.2K 3.5" SATA HDD	43W7572
IBM 73GB 10K 3.5" SAS HDD*	40K1045
IBM 146GB 10K 3.5" SAS HDD*	40K1046
IBM 300GB 10K 3.5" SAS HDD*	40K1047
IBM 73GB 15K 3.5" SAS HDD*	40K1049
IBM 146GB 15K 3.5" SAS HDD*	40K1050
IBM SAS HBA Controller	25R8060
IBM InfiniBand HTx Adapter by Q Logic	41Y4519
PCI-E x8 Riser Card	32R3288
HTx Riser Card	40K7462



Maximum internal disk capacity¹³:
 1.5TB with two 750GB SATA disks or
 600GB with two 300GB SAS disks
 and optional* SAS controller

Slot 1: Full height, half-length, PCI-E x16
 Slot 2: Full height, half-length, PCI-E x8 or HTx

Bay ① 5.25", UltraSlim 0.5", access, optional optical
 Bay ② 3.5", SL 1", no access, std fixed disk
 Bay ③ 3.5", SL 1", no access, open for fixed disk

- ⊖ Stealth black color front bezel
- ⊖ H 1.72" (1U) x W 17.3" x D 25.7"
- ⊖ H 43.7mm x W 439.9mm x L 653.3mm
- ⊖ 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- ⊖ Configuration/Setup Utility: F1 at startup
- ⊖ Network Boot: F12 at startup
- ⊖ Operator Information Panel in front
- ⊖ 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

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 69P9505)
- ⊖ Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf
- ⊖ 24x7* toll-free support for warranty issues during the warranty period³

*IBM SAS HBA Controller option required for SAS support (included on 6BU)

IBM® Type-GAV-model	Qty x Processor	L2 Core cache Memory	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7977-12y-12x	1 x Xeon™ 5050 3.0GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-22y-22x	1 x Xeon 5060 3.2GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-42y-42x	1 x Xeon 5110 1.6GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-52y-52x	1 x Xeon 5120 1.86GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-62y-62x	1 x Xeon 5130 2.0GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-72y-72x	1 x Xeon 5140 2.33GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-82y-82x	1 x Xeon 5150 2.66GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-92y-92x	1 x Xeon 5160 3.0GHz	DC 4MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	July 2006
7977-B2y-B2x	1 x Xeon E5310 1.6GHz	QC 8MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	Dec 2006
7977-C2y-C2x	1 x Xeon E5320 1.86GHz	QC 8MB 1GB	Open SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	Dec 2006

Positioning Processor *Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
 Up to 1 x Intel® Xeon Processor 3.0 GHz with 667MHz FSB / up to 1 x Intel Xeon Processor 3.2 GHz with 1066MHz FSB / 4MB L2 ECC Cache / Dual-Core / up to 1.86GHz with 1066MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T

L2 cache **4 or 8MB** / std and max / at processor speed

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

Implementation Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers

Memory **1GB** std / 48GB¹⁹ max (48GB maximum can be achieved when 4GB DIMMs are supported, 24GB is the max with less than 4GB DIMMs) / two slots used / ten slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™**: **memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller **Adaptec® AIC-9580W / eight port SAS or SATA** (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports **RAID 0, 1, 5 & 10** / ServeRAID 8k std

SAS connectors Dual channel controller wired to two hot-swap DASD backplanes

SAS cabling Two mini SAS cables connect controller to dual 4-bay backplanes

IDE controller / cable IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (DVD-ROM)

Disk - capacity None std / supports 7200-15000 rpm disks / dual backplanes

Disk - bays Eight hot-swap SAS/SATA bays

Mechanical Tower / conversion to EIA 26" Rack (5U⁴) via optional kit 39Y8382

Slots (see below) Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot

Chipset **Intel 5000P chipset** / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O

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

DVD-ROM / diskette 16X⁶ DVD-ROM / IDE / 1.6" HH; *Diskette*: USB only

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*: two USB (Vers 2.0); *Graphics*: SVGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2

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

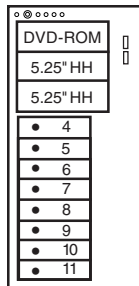
Systems mgmt	IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)	Xeon 5050 3.0GHz/667MHz/4MB L2 Cache Proc Upg	25R8926
Diagnosics	Light Path Diagnostics™ panel providing LED map to failing part (on side cover) / Information LED Panel in front	Xeon 5060 3.2GHz/1066MHz/4MB L2 Cache Proc Upg	25R8912
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others	Xeon 5110 1.6GHz/1066MHz/4MB L2 Cache Proc Upg	40K1231
		Xeon 5120 1.86GHz/1066MHz/4MB L2 Cache Proc Upg	40K1232
		Xeon E5310 1.6GHz/1066MHz/8MB L2 Cache Proc Upg	43W5821
		Xeon E5320 1.86GHz/1066MHz/8MB L2 Cache Proc Upg	43W5822
		Xeon 5130 2.0GHz/1333MHz/4MB L2 Cache Proc Upg	40K1233
		Xeon 5140 2.33GHz/1333MHz/4MB L2 Cache Proc Upg	40K1234
		Xeon 5150 2.66GHz/1333MHz/4MB L2 Cache Proc Upg	40K1235
		Xeon 5160 3.0GHz/1333MHz/4MB L2 Cache Proc Upg	40K1236
		1GB Kit (2x512MB DIMM) PC2-5300 DDR2 FBD CL4	39M5782
		2GB Kit (2x1GB DIMM) PC2-5300 DDR2 FBD CL4	39M5785
		4GB Kit (2x2GB DIMM) PC2-5300 DDR2 FBD CL4	39M5791
		146GB 10K SAS Hot-Swap HDD	40K1040
		300GB 10K SAS Hot-Swap HDD	40K1041
		36GB 15K SAS Hot-Swap HDD	40K1042
		73GB 15K SAS Hot-Swap HDD	40K1043
		146GB 15K SAS Hot-Swap HDD	40K1044
		160GB 7.2K SATA Hot-Swap HDD	39M4522
		250GB 7.2K SATA Hot-Swap HDD	39M4526
		500GB 7.2K SATA Hot-Swap HDD	39M4530
		IBM Remote Supervisor Adapter II Slimline	39Y9566
		IBM Redundant Power and Cooling Option(NA)	39Y8487

Keyboard / mouse Optional

Power supply 835 watt / std/max: one/two / hot-swap / voltage-sensing / auto-restart / redundant with optional power supply

Fans std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap / (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply

Tower



- Bay 1 5.25" HH 1.6" access, DVD-ROM
- Bay 2 5.25" HH 1.6" access, open
- Bay 3 5.25" HH 1.6" access, open
- 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 3.5", SL 1", access, hot-swap
- Bay 9 3.5", SL 1", access, hot-swap
- Bay 10 3.5", SL 1", access, hot-swap
- Bay 11 3.5", SL 1", access, hot-swap

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- Aurora RAID Configuration Utility near startup by pressing CTRL+A
- 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 17.3" x W 8.6" x D 29.4"
- 74 to 101 pounds
- Stealth black color

- Slot 1: half-length, PCI-Express x8(x4 electrical)
- Slot 2: full, PCI-Express x8
- Slot 3: full, PCI-Express x8
- Slot 4: full, 64-bit 133MHz 3.3v PCI-X
- Slot 5: full, 64-bit 133MHz 3.3v PCI-X
- Slot 6: half-length, 32-bit 33MHz 5.0v PCI

All models: Max internal disk capacity: 2.4TB² with eight 300GB 10K SAS or 2.0TB² with eight 250GB SATA hot-swap HDDs

LIMITED WARRANTY³

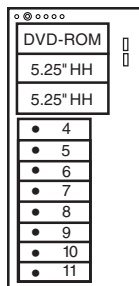
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (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 Core cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7977- F2x	1 x Xeon™ E5335 2.0GHz	QC 8MB	1GB	Open	SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	Feb 2007
7977- G2x	1x Xeon E5345 2.33GHz	QC 8MB	1GB	Open	SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	Feb 2007
7977- H2x	1x Xeon E5355 2.66GHz	QC 8MB	1GB	Open	SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	Feb 2007

Positioning Processor	<i>Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price</i> Up to 1 x Intel® Xeon Processor up to 2.66GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T									
L2 cache SMP support Implementation	8MB / std and max / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers									
Memory	1GB std / 48GB ¹³ max (48GB maximum can be achieved when 4GB DIMMs are supported, 24GB is the max with less than 4GB DIMMs) / two slots used / ten slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill									
SAS/SATA controller	Adaptec® AIC-9580W / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1, 5 & 10 / ServeRAID 8k std									
SAS connectors	Dual channel controller wired to two hot-swap DASD backplanes									
SAS cabling	Two mini SAS cables connect controller to dual 4-bay backplanes									
IDE controller / cable	IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (DVD-ROM)									
Disk - capacity	None std / supports 7200-15000 rpm disks / dual backplanes									
Disk - bays	Eight hot-swap SAS/SATA bays									
Mechanical Slots (see below) Chipset	Tower / conversion to EIA 26" Rack (5U ⁴) via optional kit 39Y8382 Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O									
Ethernet controller	Dual 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-Express 64-bit 100MHz / full duplex / Wake on LAN® / IPMI (2.0)									
DVD-ROM / diskette Rear ports	16X ⁶ DVD-ROM / IDE / 1.6" HH; Diskette: USB only 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: two USB (Vers 2.0); Graphics: SVGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2									
Security	Power-on password / administrator password / front door to cover disk bays and power button / unattended boot / selectable boot									
Systems mgmt	IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)									
Diagnostics	Light Path Diagnostics™ panel providing LED map to failing part (on side cover) / Information LED Panel in front									
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others									
Keyboard / mouse	Optional									
Power supply	835 watt / std/max: one/two / hot-swap / voltage-sensing / auto-restart / redundant with optional power supply									
Fans	std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap / (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply									

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

Tower



- Bay 1 5.25", HH 1.6" access, DVD-ROM
- Bay 2 5.25", HH 1.6" access, open
- Bay 3 5.25", HH 1.6" access, open
- 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 3.5", SL 1", access, hot-swap
- Bay 9 3.5", SL 1", access, hot-swap
- Bay 10 3.5", SL 1", access, hot-swap
- Bay 11 3.5", SL 1", access, hot-swap

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- Aurora RAID Configuration Utility near startup by pressing CTRL+A
- 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 17.3" x W 8.6" x D 29.4"
- 74 to 101 pounds
- Stealth black color

- Slot 1: half-length, PCI-Express x8(x4 electrical)
- Slot 2: full, PCI-Express x8
- Slot 3: full, PCI-Express x8
- Slot 4: full, 64-bit 133MHz 3.3v PCI-X
- Slot 5: full, 64-bit 133MHz 3.3v PCI-X
- Slot 6: half-length, 32-bit 33MHz 5.0v PCI

All models: Max internal disk capacity:
2.4TB² with eight 300GB 10K SAS or
2.0TB² with eight 250GB SATA hot-swap 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-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
7978-G5y-G5x	1 x Xeon™ 5050 3.0GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year	July 2006	
7978-G6y-G6x	1 x Xeon 5050 3.0GHz/DC	4MB	1GB	(open 3.5)	SATA Combo	670W	2 simple-swap	2x4	2 x GB	3 year	July 2006	
7978-45y-45x	1 x Xeon 5080 3.73GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year	July 2006	
7978-4Sy-4Sx	1 x Xeon 5080 3.73GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA Combo	670W	4 hot-swap	2x4	2 x GB	3 year	July 2006	

Positioning Processor
A highly manageable, ultra-dense 1U, 2-way server delivering performance computing in space-constrained environments
 Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)
2 MB / per core / at processor speed
2-way SMP / up to two Xeon Processors (same speed/cache size)
SMP support Implementation
 Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory
1GB std / 32GB¹³ max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™**: memory mirroring, online-spare memory, Chipkill

SAS/SATA controller
Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA (300MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID / optional IBM ServeRAID™-8k Adaptor** for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SAS connectors
 One internal connection wired to DASD backplane
IDE controller/cable
 Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity
 None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays
 Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

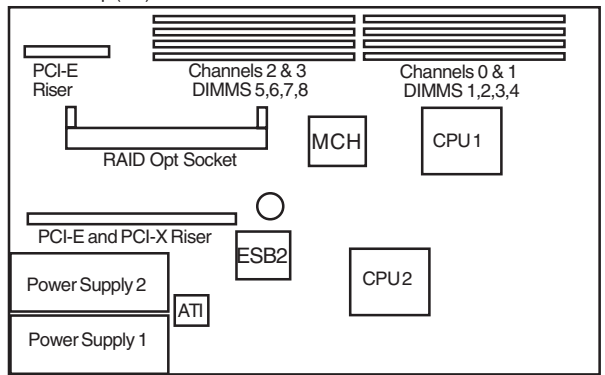
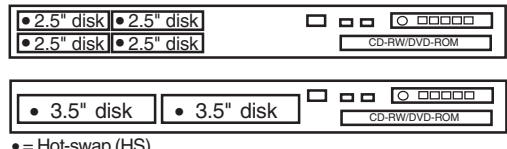
Mechanical Chipset
EIA 19" Rack (1U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000X chipset / Intel Memory Controller Hub (MCH) provides one PCI-Express x8 slot / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links or one 64-bit/133MHz PCI-X slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots
 (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

Ethernet controller
 Two gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette
 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front & Rear ports
Front: two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
Graphics
 SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt
 Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon 3.0GHz/667MHz - 2 x 2MB L2 Cache	25R8921
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 3.73GHz/1066MHz - 2 x 2MB L2 Cache	25R8924
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512MB)	39M5782
Power supply	<i>Std/Max:</i> one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ <i>Std:</i> ten fans; <i>Max:</i> twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		670 Watt Hot-swap Power Supply Option (US)	32R2815
		PCI Riser Card PCI-X Option	32R8216

Other options at ibm.com/products/us



Slot 1: PCI-Express x8(x8 Links) half length
 Slot 2*: PCI-Express x8(x4 Links) or 64-bit 133MHz 3.3v PCI-X; both half length
 * riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 600GB² with two 300GB SL disks
 2.5" SAS models: 292GB² with four 73.4GB SFF disks
 3.5" SATA models: 1TB² with two 500GB SL disks

See footnotes for important warranty information

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[®] 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac21P2173)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac21P2074)
- 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
7978-21y-21x	1 x Xeon™ 5110 1.6GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-22y-22x	1 x Xeon 5110 1.6GHz/DC	4MB	1GB	(open 3.5)	SATA Combo	670W	2 simple-swap	2x4	2 x GB	3 year Aug	2006	
7978-31y-31x	1 x Xeon 5120 1.86GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-32y-32x	1 x Xeon 5120 1.86GHz/DC	4MB	1GB	(open 3.5)	SATA Combo	670W	2 simple-swap	2x4	2 x GB	3 year Aug	2006	
7978-3Ay-3Ax	1 x Xeon 5120 1.86GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA Combo	670W	4 hot-swap	2x4	2 x GB	3 year Aug	2006	

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 Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)
2 MB / per core / at processor speed
2-way SMP / up to two Xeon Processors (same speed/cache size)
SMP support Implementation Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory **1GB** std / 32GB¹³ max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™**: memory mirroring, online-spare memory, Chipkill

SAS/SATA controller **Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA** (300MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID / optional IBM ServeRAID™-8k Adaptor** for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SAS connectors One internal connection wired to DASD backplane
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical Chipset **EIA 19" Rack (1U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000X chipset / Intel Memory Controller Hub (MCH) provides one PCI-Express x8 slot / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links or one 64-bit/133MHz PCI-X slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

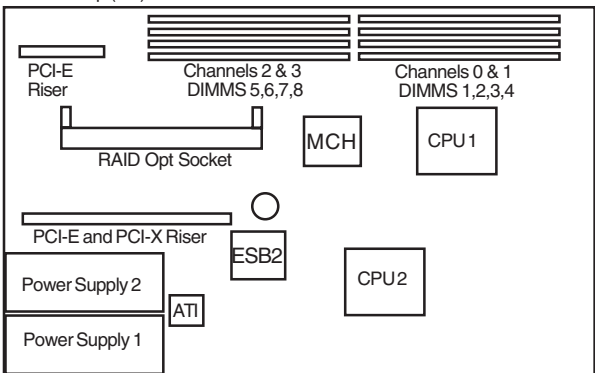
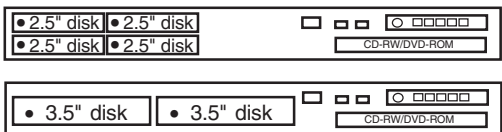
Ethernet controller Two gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear

Optical / diskette Front & Rear ports 8X-24X⁶ CD-RW/DVD-ROM / USB only
Graphics Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
 SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon 1.6GHz/1066MHz - 2 x 2MB L2 Cache	40K1237
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 1.86GHz/1066MHz - 2 x 2MB L2 Cache	40K1238
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512MB)	39M5782
Power supply	Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		670 Watt Hot-swap Power Supply Option (US)	32R2815
		PCI Riser Card PCI-X Option	32R8216

Other options at ibm.com/products/us



Slot 1: PCI-Express x8(x8 Links) half length
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 * riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 600GB² with two 300GB SL disks
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- 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
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- 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
7978-41y-41x	1 x Xeon™ 5130 2.0GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-42y-42x	1 x Xeon 5130 2.0GHz/DC	4MB	1GB	(open 3.5)	SATA Combo	670W	2 simple-swap	2x4	2 x GB	3 year Aug	2006	
7978-4Ay-4Ax	1 x Xeon 5130 2.0GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA Combo	670W	4 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-51y-51x	1 x Xeon 5140 2.33GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-5Ay-5Ax	1 x Xeon 5140 2.33GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA Combo	670W	4 hot-swap	2x4	2 x GB	3 year Aug	2006	

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2 MB / per core / at processor speed
2-way SMP / up to two Xeon Processors (same speed/cache size)
SMP support Implementation Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory **1GB** std / 32GB¹³ max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™**: memory mirroring, online-spare memory, Chipkill

SAS/SATA controller **Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA** (300MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID / optional IBM ServeRAID™-8k Adaptor** for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SAS connectors One internal connection wired to DASD backplane
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical Chipset **EIA 19" Rack (1U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000X chipset / Intel Memory Controller Hub (MCH) provides one PCI-Express x8 slot / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links or one 64-bit/133MHz PCI-X slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

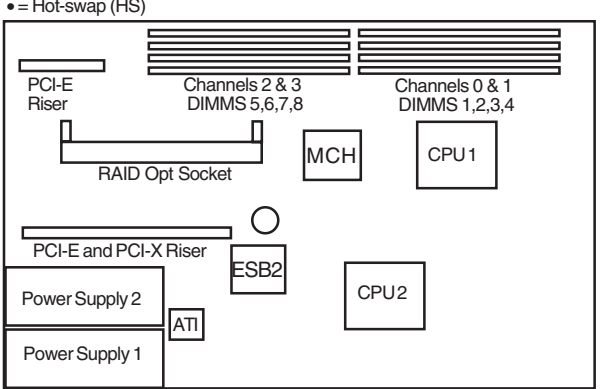
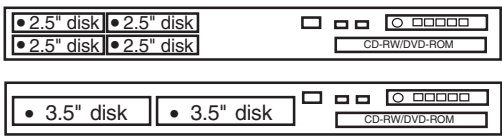
Ethernet controller Two gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear

Optical / diskette Front & Rear ports 8X-24X⁶ CD-RW/DVD-ROM / USB only
Graphics Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
 SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon 2.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1239
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 2.33GHz/1333MHz - 2 x 2MB L2 Cache	40K1240
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512MB)	39M5782
Power supply	Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		670 Watt Hot-swap Power Supply Option (US)	32R2815
		PCI Riser Card PCI-X Option	32R8216

Other options at ibm.com/products/us



Slot 1: PCI-Express x8(x8 Links) half length
 Slot 2*: PCI-Express x8(x4 Links) or 64-bit 133MHz 3.3v PCI-X; both half length
 * riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 600GB² with two 300GB SL disks
 2.5" SAS models: 292GB² with four 73.4GB SFF disks
 3.5" SATA models: 1TB² with two 500GB SL disks

See footnotes for important warranty information

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[®] 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac21P2173)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac21P2074)
- 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
7978-61y-61x	1 x Xeon™ 5150 2.66GHz/DC	4MB 1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-6Ay-6Ax	1 x Xeon 5150 2.66GHz/DC	4MB 1GB	(open 3.5)	SAS/SATA Combo	670W	4 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-71y-71x	1 x Xeon 5160 3.0GHz/DC	4MB 1GB	(open 3.5)	SAS/SATA Combo	670W	2 hot-swap	2x4	2 x GB	3 year Aug	2006	
7978-7Ay-7Ax	1 x Xeon 5160 3.0GHz/DC	4MB 1GB	(open 2.5)	SAS/SATA Combo	670W	4 hot-swap	2x4	2 x GB	3 year Aug	2006	

Positioning Processor A highly manageable, ultra-dense 1U, 2-way server delivering performance computing in space-constrained environments
 Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)
2 MB / per core / at processor speed
2-way SMP / up to two Xeon Processors (same speed/cache size)
SMP support Implementation Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory **1GB** std / 32GB¹³ max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™**: memory mirroring, online-spare memory, Chipkill

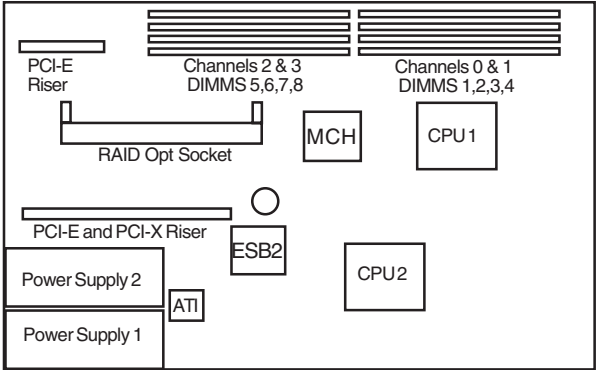
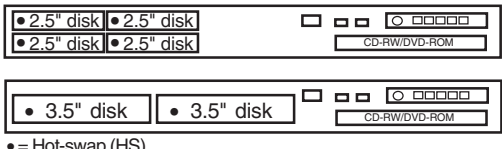
SAS/SATA controller **Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA** (300MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID / optional IBM ServeRAID™-8k Adaptor** for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SAS connectors One internal connection wired to DASD backplane
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical Chipset **EIA 19" Rack (1U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000X chipset / Intel Memory Controller Hub (MCH) provides one PCI-Express x8 slot / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links or one 64-bit/133MHz PCI-X slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

Ethernet controller Two gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front & Rear ports Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
Graphics SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon 2.66GHz/1333MHz - 2 x 2MB L2 Cache	40K1241
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 3.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1242
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512MB)	39M5782
Power supply	Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		670 Watt Hot-swap Power Supply Option (US)	32R2815
		PCI Riser Card PCI-X Option	32R8216



Slot 1: PCI-Express x8(x8 Links) half length
 Slot 2*: PCI-Express x8(x4 Links) or 64-bit 133MHz 3.3v PCI-X; both half length
 * riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 600GB² with two 300GB SL disks
 2.5" SAS models: 292GB² with four 73.4GB SFF disks
 3.5" SATA models: 1TB² with two 500GB SL disks

See footnotes for important warranty information

- ⊘ Quick release adapter slots (no screws)
- ⊘ Configuration/Setup Utility: F1 at startup
- ⊘ Diagnostics (PC-Doctor™): F2 at startup
- ⊘ Network Boot: F12 at startup
- ⊘ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
- ⊘ 28 to 35.5 pounds
- ⊘ Stealth black color

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[®] 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac21P2173)
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- ⊘ 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
7978-A1y-A1x	1 x Xeon™ E5310 1.6GHz/QC	8MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Dec 2006
7978-C1y-C1x	1 x Xeon E5320 1.86GHz/QC	8MB	2GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Dec 2006
7978-A2y-A2x	1 x Xeon E5335 2.0GHz/QC	8MB	2GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x2	2 x GB	3 year	Feb 2007
7978-C2y-C2x	1 x Xeon E5345 2.33GHz/QC	8MB	2GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x2	2 x GB	3 year	Feb 2007
7978-CBy-CBx	1 x Xeon E5345 2.33GHz/QC	8MB	2GB	(open 2.5)	SAS	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Feb 2007
7978-CCy-CCx	1 x Xeon E5355 2.66GHz/QC	8MB	2GB	(open 3.5)	SATA	Combo	670W	2 simple-swap	2x2	2 x GB	3 year	Feb 2007

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Up to 1x Intel® Xeon Processor 1.86GHz with 1066MHz FSB / up to 1x Intel Xeon Processor 2.66GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST) 8 MB / std and max / at processor speed
L2 cache
SMP support 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

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SAS/SATA controller Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports RAID 0, 1, & 10 ; some: simple swap, supports HostRAID / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SAS connectors One internal connection wired to DASD backplane
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
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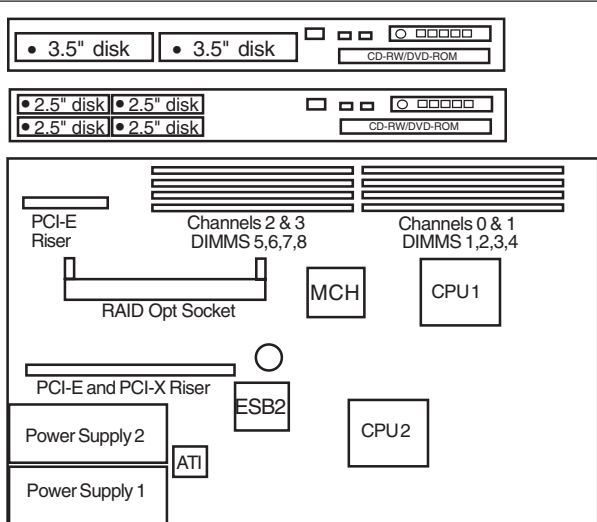
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Ethernet controller Two gigabit 10/100/1000 ethernet ports / Two Broadcom® 5708 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear

Optical / diskette Front & Rear ports 8X-24X* CD-RW/DVD-ROM / USB only
Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

Graphics SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3
Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon E5310 1.6GHz/1066MHz/8MB L2 Cache	40K1257
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon E5320 1.86GHz/1066MHz/8MB L2 Cache	40K1249
Keyboard / mouse	None standard (because rack-based) / USB only	Xeon E5335 2.0GHz/1333MHz/8MB L2 Cache	40K1272
Power supply	Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	Xeon E5345 2.33GHz/1333MHz/8MB L2 Cache	40K1258
Fans	Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	Xeon E5355 2.66GHz/1333MHz/8MB L2 Cache	40K1251
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	1GB PC2-5300 FBD (2 x 512MB)	39M5782
		2GB PC2-5300 FBD (2 x 1GB)	39M5785
		4GB PC2-5300 FBD (2 x 2GB)	39M5791
		8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
		IBM ServeRAID-8k Adaptor	25R8064
		IBM Remote Supervisor Adapter II Slim	73P9341
		250GB 7.2K rpm SATA II hot-swap	39M4526
		500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
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		670 Watt Hot-swap Power Supply Option (US)	32R2815
		PCI Riser Card PCI-X Option	32R8216
		Other options at ibm.com/pc/us/accessories	



- ❖ Quick release adapter slots (no screws)
- ❖ Configuration/Setup Utility: F1 at startup
- ❖ Diagnostics (PC-Doctor™): F2 at startup
- ❖ Network Boot: F12 at startup
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- ❖ Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
- ❖ 28 to 35.5 pounds
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 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2074)
- 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

Slot 1: PCI-Express x8(x8 Links) half length
 Slot 2: PCI-Express x8(x4 Links) or 64-bit 133MHz 3.3v PCI-X; both half length
 * riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 600GB² with two 300GB SL disks
 2.5" SAS models: 292GB² with four 73.4GB SFF disks
 3.5" SATA models: 1TB² with two 500GB SL disks

See footnotes for important warranty information

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
7978-JAu-JAx	1 x Xeon™ L5310 1.6GHz/QC	8MB	2GB	(open 2.5)	SAS	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	May 2007
7978-JBu-JBx	1 x Xeon L5320 1.86GHz/QC	8MB	2GB	(open 2.5)	SAS	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	May 2007

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Up to 1x Intel® Xeon Processor 1.86GHz with 1066MHz FSB / 8MB L2 ECC Cache / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST)
L2 cache 8 MB / std and max / at processor speed
SMP support 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory 1 or 2GB std / 32GB¹³ max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller **Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA** (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, & 10** ; some: simple swap, supports **HostRAID / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50** (installed on reserved internal connector)
SAS connectors One internal connection wired to DASD backplane
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical Chipset **EIA 19" Rack (1U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion**
Intel 5000X chipset / Intel Memory Controller Hub (MCH) provides one PCI-Express x8 slot / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links or one 64-bit/133MHz PCI-X slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

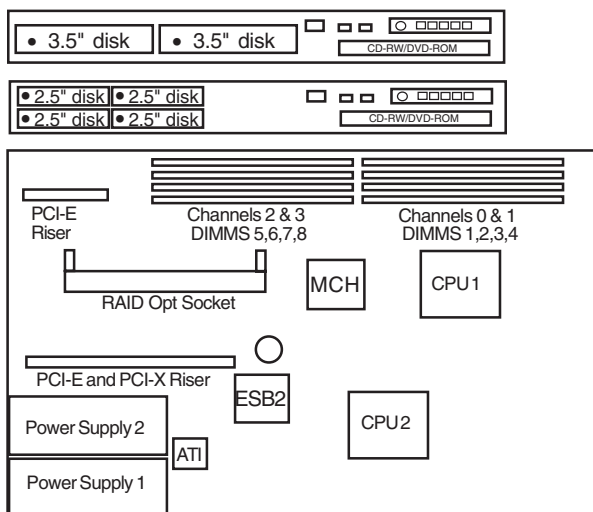
Ethernet controller Two gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette 8X-24X⁵ CD-RW/DVD-ROM / USB only
Front & Rear ports Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
Graphics SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Software	Keyboard / mouse	Power supply	Fans	Prerequisites
Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	None standard (because rack-based) / USB only	Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Xeon L5310 1.6GHz/1066MHz/8MB L2 Cache	43W5909
Xeon L5320 1.86GHz/1066MHz/8MB L2 Cache	43W5910
1GB PC2-5300 FBD (2 x 512MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB)	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	39Y9566
250GB 7.2K rpm SATA II hot-swap	39M4526
500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
670 Watt Hot-swap Power Supply Option (US)	32R2815
PCI Riser Card PCI-X Option	32R8216

Other options at ibm.com/products/us



Slot 1: PCI-Express x8(x8 Links) half length
 Slot 2*: PCI-Express x8(x4 Links) or 64-bit 133MHz 3.3v PCI-X; both half length
 * riser determines PCI-Express or PCI-X

- ↳ Quick release adapter slots (no screws)
- ↳ Configuration/Setup Utility: F1 at startup
- ↳ Diagnostics (PC-Doctor™): F2 at startup
- ↳ Network Boot: F12 at startup
- ↳ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
- ↳ 28 to 35.5 pounds
- ↳ Stealth black color

Max internal disk capacity:
 3.5" SAS models: 600GB² with two 300GB SL disks
 2.5" SAS models: 292GB² with four 73.4GB SFF disks
 3.5" SATA models: 1TB² with two 500GB SL 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
- ↳ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac® 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2173)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2074)
- ↳ 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-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-G5y-G5x	1 x Xeon™ 5050 3.0GHz	DC 4MB	1GB	Open 3.5"	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-G5y-G5x	1 x Xeon 5050 3.0GHz	DC 4MB	1GB	Open 2.5"	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-H5y-H5x	1 x Xeon 5063 3.2GHz	DC 4MB	1GB	Open 3.5"	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-H5y-H5x	1 x Xeon 5063 3.2GHz	DC 4MB	1GB	Open 2.5"	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006

Positioning Processor A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.2 GHz** with 1066MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

L2 cache **2 MB** / per core / at processor speed

SMP support Implementation **2-way SMP** / up to two Xeon Processors (same speed/cache size)
Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers

Memory **1GB** std / 48GB¹³ max / two slots used / ten slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™**: memory mirroring, online-spare memory, Chipkill

SAS/SATA controller **Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS or SATA** (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports **RAID 0, 1 & 10** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported

SAS connectors One internal connection wired to DASH backplane / one external connector

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

Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane

Disk - bays Some: six hot-swap 3.5" SAS or SATA HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in each disk bay

Tape backup Optional internal and external / 3.5" / USB or SATA

Mechanical Chipset **EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion

Chipset **Intel 5000P chipset** / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O

Bus slots (See below) Four PCI-Express x8 or two PCI-X 1.0 and two PCI-Express x8 / no hot-swap Active™ PCI slots

Ethernet controller Dual gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear

Optical / diskette 8X-24X⁶ CD-RW/DVD-ROM / USB only

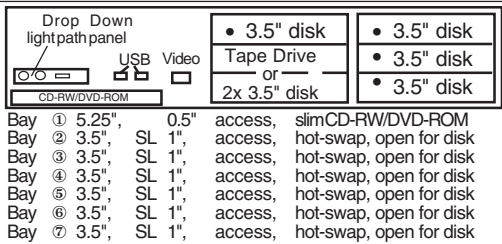
Front & Rear ports **Front**: two USB (Vers 2.0), graphics (DB-15) **Rear**: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / one parallel port

Graphics SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence

IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon 3.0GHz/667MHz - 2 x 2MB L2 Cache	25R8926
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 3.2GHz/1066MHz - 2 x 2MB L2 Cache	25R8927
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512MB)	39M5782
Power supply	Std/Max : one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ Std: five fans; Max: ten (five fans with optional second power supply) / redundant with ten fans installed; All: variable speed / hot-swap / PFA Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites		8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
		750GB HS SATA 3.5" HDD	43W7576
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		835 Watt Hot-swap Power Supply Option (US)	40K1905
		835 Watt Hot-swap Power Supply Option (WW)	40K1906
		PCI Riser Card PCI-X Option	40K1908
		Other options at ibm.com/products/us	



Bay ①	5.25", 0.5"	access,	slim CD-RW/DVD-ROM
Bay ②	3.5", SL 1"	access,	open for Tape Drive
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

Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 133MHz 3.3v PCI-X
Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 133MHz 3.3v PCI-X
Slot 3: low-profile, PCI-Express x8(x4 Links)
Slot 4: low-profile, PCI-Express x8(x4 Links)

*slots 1 & 2 riser determines PCI-Express or PCI-X
See footnotes for important warranty information

2U Rack with 3.5" SAS	• 3.5" disk	• 3.5" disk	• 3.5" disk
	Tape Drive	• 3.5" disk	• 3.5" disk
	or	• 3.5" disk	• 3.5" disk
	2x 3.5" disk	• 3.5" disk	• 3.5" disk

- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- Network Boot: F12 at startup
- Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 65 pounds
- Stealth black color

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

Max internal disk capacity:
3.5" SAS models: 1.8TB² with six 300GB SL disks
3.5" SATA models: 4.5TB² with six 750GB disks
2.5" SAS models: 1.2TB² with eight 146GB SFF disks

IBM® Type-GAV-model	Qty x Processor	Core	L2 cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-21y-21x	1 x Xeon™ 5110	1.6GHz	DC 4MB	1GB	Open 3.5"	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-2Ay-2Ax	1 x Xeon 5110	1.6GHz	DC 4MB	1GB	Open 2.5"	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-31y-31x	1 x Xeon 5120	1.86GHz	DC 4MB	1GB	Open 3.5"	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-3Ay-3Ax	1 x Xeon 5120	1.86GHz	DC 4MB	1GB	Open 2.5"	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-41y-41x	1 x Xeon 5130	2.0GHz	DC 4MB	1GB	Open 3.5"	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-4Ay-4Ax	1 x Xeon 5130	2.0GHz	DC 4MB	1GB	Open 2.5"	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006

Positioning Processor A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments
Up to **1x Intel® Xeon Processor 1.86 GHz** with 1066MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

L2 cache **2 MB** / per core / at processor speed
SMP support **2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers

Memory **1GB** std / 48GB¹³ max / two slots used / ten slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller **Adaptec® AIC-9580W** / dual channel SAS controller / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adapter for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported

SAS connectors One internal connection wired to DASD backplane / one external connector
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: six hot-swap 3.5" SAS or SATA HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in each disk bay
Tape backup Optional internal and external / 3.5" / USB or SATA

Mechanical Chipset **EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O

Bus slots (See below) Four PCI-Express x8 or two PCI-X 1.0 and two PCI-Express x8 / no hot-swap Active™ PCI slots

Ethernet controller Dual gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear

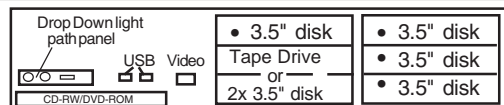
Optical / diskette Front & Rear ports 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front: two USB (Vers 2.0), graphics (DB-15) **Rear:** four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port

Graphics SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Software	Keyboard / mouse	Power supply	Fans	Prerequisites
Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	None standard (because rack-based) / USB only	<i>Std/Max:</i> one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	Calibrated Vectored Cooling™ <i>Std:</i> five fans; <i>Max:</i> ten (five fans with optional second power supply) / redundant with ten fans installed; <i>All:</i> variable speed / hot-swap / PFA	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

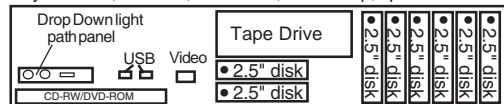
Xeon 1.60GHz/1066MHz - 2 x 2MB L2 Cache	40K1231
Xeon 1.86GHz/1066MHz - 2 x 2MB L2 Cache	40K1232
Xeon 2.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1233
1GB PC2-5300 FBD (2 x 512 MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	39Y9566
500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
750GB HS SATA 3.5" HDD	43W7576
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
835 Watt Hot-swap Power Supply Option (US)	40K1905
PCI Riser Card PCI-X Option	40K1908
Other options at ibm.com/products/us	



Bay	Height	Cache	Access	Notes
Bay ①	5.25"	0.5"	access, slim	CD-RW/DVD-ROM
Bay ②	3.5"	SL 1"	access,	open for Tape Drive
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

2U Rack with 3.5" SAS

• = Hot-swap (HS)



Bay	Height	Cache	Access	Notes
Bay ①	5.25"	0.5"	access, slim	CD-RW/DVD-ROM
Bay ②	3.5"	SFF 1"	access,	open for Tape Drive
Bay ③	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ④	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ⑤	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ⑥	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ⑦	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ⑧	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ⑨	2.5"	SFF 1"	access,	hot-swap, open for disk
Bay ⑩	2.5"	SFF 1"	access,	hot-swap, open for disk

- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- Network Boot: F12 at startup
- Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 65 pounds
- Stealth black color

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

Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 133MHz 3.3v PCI-X
Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 133MHz 3.3v PCI-X
Slot 3: low-profile, PCI-Express x8(x4 Links)
Slot 4: low-profile, PCI-Express x8(x4 Links)
*slots 1 & 2 riser determines PCI-Express or PCI-X

Max internal disk capacity:
3.5" SAS models: 1.8TB² with six 300GB SL disks
3.5" SATA models: 4.5TB² with six 750GB disks
2.5" SAS models: 1.2TB² with eight 146GB SFF disks

See footnotes for important warranty information

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-51y-51x	1 x Xeon™ 5140 2.33GHz	DC 4MB	1GB	3.5" Open	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-5Ay-5Ax	1 x Xeon 5140 2.33GHz	DC 4MB	1GB	2.5" Open	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-61y-61x	1 x Xeon 5150 2.66GHz	DC 4MB	1GB	3.5" Open	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-6Ay-6Ax	1 x Xeon 5150 2.66GHz	DC 4MB	1GB	2.5" Open	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-71y-71x	1 x Xeon 5160 3.0GHz	DC 4MB	1GB	3.5" Open	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-7Ay-7Ax	1 x Xeon 5160 3.0GHz	DC 4MB	1GB	2.5" Open	SAS / SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006

Positioning Processor A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments
 Up to **1x Intel® Xeon Processor 1.86 GHz** with 1066MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)
L2 cache 2 MB / per core / at processor speed
SMP support 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers

Memory 1GB std / 48GB¹³ max / two slots used / ten slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

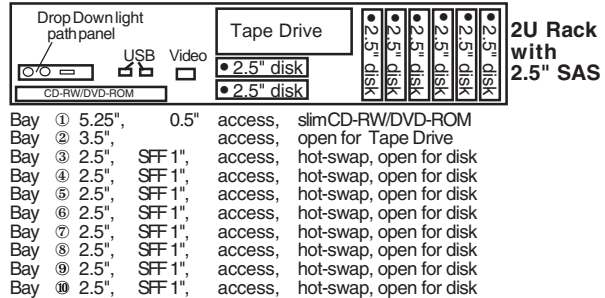
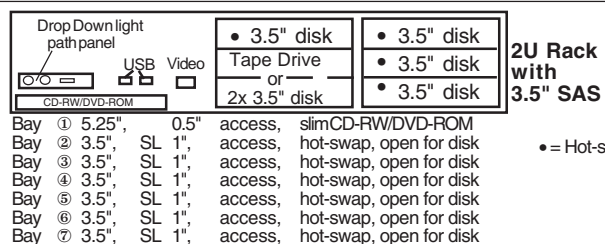
SAS/SATA controller **Adaptec® AIC-9580W** / dual channel SAS controller / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported
SAS connectors One internal connection wired to DASD backplane / one external connector
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: six hot-swap 3.5" SAS or SATA HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in each disk bay
Tape backup Optional internal and external / 3.5" / USB or SATA

Mechanical Chipset **EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots (See below) Four PCI-Express x8 or two PCI-X 1.0 and two PCI-Express x8 / no hot-swap Active™ PCI slots

Ethernet controller Dual gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front & Rear ports Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port
Graphics SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

Security Systems mgmt Power-on password / administrator password / unattended boot / selectable boot sequence
IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon 2.33GHz/1333MHz - 2 x 2MB L2 Cache	40K1234
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 2.66GHz/1333MHz - 2 x 2MB L2 Cache	40K1235
Keyboard / mouse	None standard (because rack-based) / USB only	Xeon 3.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1236
Power supply	Std/Max: one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	1GB PC2-5300 FBD (2 x 512 MB)	39M5782
Fans	Calibrated Vectored Cooling™ Std: five fans; Max: ten (five fans with optional second power supply) / redundant with ten fans installed; All: variable speed / hot-swap / PFA Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Prerequisites		4GB PC2-5300 FBD (2 x 2GB)	39M5791
		8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adaptor	25R8064
		IBM Remote Supervisor Adaptor II Slim	39Y9566
		500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
		750GB HS SATA 3.5" HDD	43W7576
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		835 Watt Hot-swap Power Supply Option (US)	40K1905
		PCI Riser Card PCI-X Option	40K1908
		Other options at ibm.com/products/us	



Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 133MHz 3.3v PCI-X
 Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 133MHz 3.3v PCI-X
 Slot 3: low-profile, PCI-Express x8(x4 Links)
 Slot 4: low-profile, PCI-Express x8(x4 Links)
 *slots 1 & 2 riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 1.8TB² with six 300GB SL disks
 3.5" SATA models: 4.5TB² with six 750GB disks
 2.5" SAS models: 1.2TB² with eight 146GB SFF disks

See footnotes for important warranty information

- ↳ Quick release adapter slots (no screws)
- ↳ Configuration/Setup Utility: F1 at startup
- ↳ Diagnostics (PC-Doctor™): F2 at startup
- ↳ Network Boot: F12 at startup
- ↳ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 65 pounds
- ↳ Stealth black color

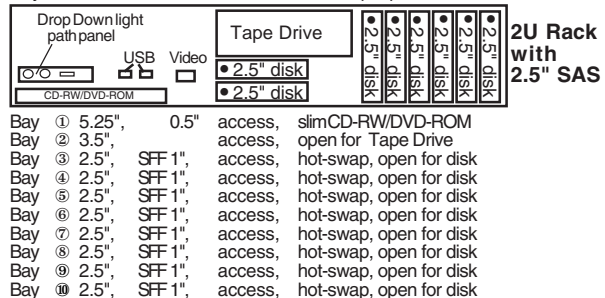
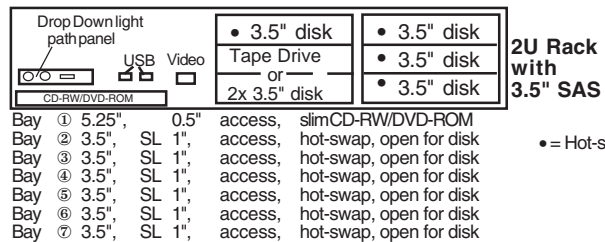
LIMITED WARRANTY³

- ↳ 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

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-A1y-A1x	1 x Xeon™ E5310 1.6GHz	QC 8MB	1GB	3.5" Open	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Dec 2006
7979-C1y-C1x	1 x Xeon E5320 1.86GHz	QC 8MB	2GB	3.5" Open	SAS / SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Dec 2006

Positioning Processor	2U Rack with 3.5" SAS or SATA with high availability, scalability and expandability for application-serving Web environments Up to 1x Intel® Xeon Processor 1.86GHz with 1066MHz FSB Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST)
L2 cache SMP support Implementation	8MB / std and max / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers
Memory	1 or 2GB std / 48GB ¹³ max / two slots used / ten slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill
SAS/SATA controller	Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS or SATA (300MB/sec SATA) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported
SAS connectors IDE controller/cable	One internal connection wired to DASD backplane / one external connector Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM)
Disk - capacity	None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays	Some: six hot-swap 3.5" SAS or SATA HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in open bays
Tape backup	Optional internal and external / 3.5" / USB or SATA
Mechanical Chipset	EIA 19" Rack (2U ⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots	(See below) Four PCI-Express x8 or two PCI-X 1.0 and two PCI-Express x8 / no hot-swap Active™ PCI slots
Ethernet controller	Dual gigabit 10/100/1000 ethernet ports / Two Broadcom® 5708 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette	8X-24X ⁶ CD-RW/DVD-ROM / USB only
Front & Rear ports	Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port
Graphics	SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3
Security Systems mgmt	Power-on password / administrator password / unattended boot / selectable boot sequence IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon E5310 1.6GHz/1066MHz/8MB L2 Cache	43W5821
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon E5320 1.86GHz/1066MHz/8MB L2 Cache	43W5822
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512 MB)	39M5782
Power supply	Std/Max: one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ Std: five fans; Max: ten (five fans with optional second power supply) / redundant with ten fans installed;All: variable speed / hot-swap / PFA	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
		750GB HS SATA 3.5" HDD	43W7576
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		835 Watt Hot-swap Power Supply Option (US)	40K1905
		PCI Riser Card PCI-X Option	40K1908



- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- Network Boot: F12 at startup
- Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 65 pounds
- Stealth black color

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)
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- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 133MHz 3.3v PCI-X
 Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 133MHz 3.3v PCI-X
 Slot 3: low-profile, PCI-Express x8(x4 Links)
 Slot 4: low-profile, PCI-Express x8(x4 Links)
 *slots 1 & 2 riser determines PCI-Express or PCI-X

Max internal disk capacity:
 3.5" SAS models: 1.8TB² with six 300GB SL disks
 3.5" SATA models: 4.5TB² with six 750GB disks
 2.5" SAS models: 1.2TB² with eight 146GB SFF disks

See footnotes for important warranty information

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-A2y-A2x	1 x Xeon™ E5335	2.0GHz QC 8MB	2GB	3.5" Open	SAS/SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Dec 2006
7979-ABy-ABx	1 x Xeon E5335	2.0GHz QC 8MB	2GB	2.5" Open	SAS/SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Dec 2006
7979-CAy-CAx	1 x Xeon E5320	1.86GHz QC 8MB	2GB	3.5" Open	SAS/SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Feb 2007
7979-CBy-CBx	1 x Xeon E5345	2.33GHz QC 8MB	2GB	2.5" Open	SAS/SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Feb 2007
7979-C3y-C3x	1 x Xeon E5355	2.66GHz QC 8MB	2GB	3.5" Open	SAS/SATA	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Feb 2007
7979-CCy-CCx	1 x Xeon E5355	2.66GHz QC 8MB	2GB	2.5" Open	SAS/SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Feb 2007

Positioning Processor 2U Rack with 3.5" SAS or SATA with high availability, scalability and expandability for application-serving Web environments
 Up to 1x Intel® Xeon Processor 1.86GHz with 1066MHz FSB / 1x Intel Xeon Processor up to 2.66GHz with 1333 FSB / Quad-Core / **Extended Memory 64 Technology (EM64T)** / Enhanced Intel Speedstep Technology (EIST)

L2 cache 8MB / std and max / at processor speed
SMP support 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers

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SAS/SATA controller Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported

SAS connectors One internal connection wired to DASD backplane / one external connector
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Tape backup Optional internal and external / 3.5" / USB or SATA

Mechanical Chipset EIA 19" Rack (2U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O

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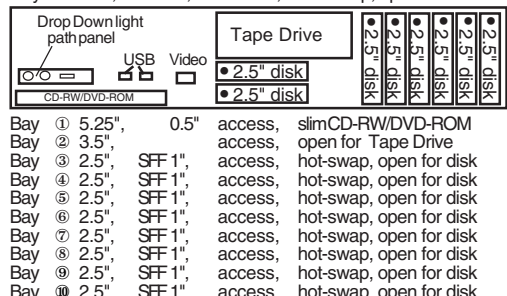
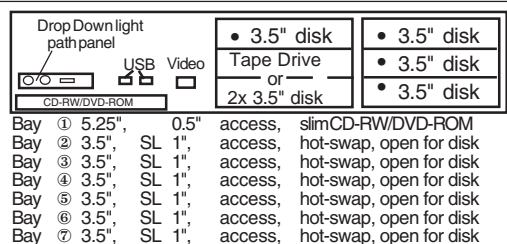
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Optical / diskette Front & Rear ports 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front: two USB (Vers 2.0), graphics (DB-15) **Rear:** four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port

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IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon E5320 1.86GHz/1066MHz/8MB L2 Cache	43W5822
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon E5335 2.0GHz/1333MHz/8MB L2 Cache	43W5823
Keyboard / mouse	None standard (because rack-based) / USB only	Xeon E5345 2.33GHz/1333MHz/8MB L2 Cache	43W5824
Power supply	<i>Std/Max:</i> one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	Xeon E5355 2.66GHz/1333MHz/8MB L2 Cache	43W5825
Fans	Calibrated Vectored Cooling™ <i>Std:</i> five fans; <i>Max:</i> ten (five fans with optional second power supply) / redundant with ten fans installed; <i>All:</i> variable speed / hot-swap / PFA	1GB PC2-5300 FBD (2 x 512 MB)	39M5782
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	2GB PC2-5300 FBD (2 x 1GB)	39M5785
		4GB PC2-5300 FBD (2 x 2GB)	39M5791
		8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adaptor	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
		750GB HS SATA HDD	43W7576
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
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- Quick release adapter slots (no screws)
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- Diagnostics (PC-Doctor™): F2 at startup
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- Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)
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- 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/wamomxue.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 133MHz 3.3v PCI-X
 Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 133MHz 3.3v PCI-X
 Slot 3: low-profile, PCI-Express x8(x4 Links)
 Slot 4: low-profile, PCI-Express x8(x4 Links)
 *slots 1 & 2 riser determines PCI-Express or PCI-X

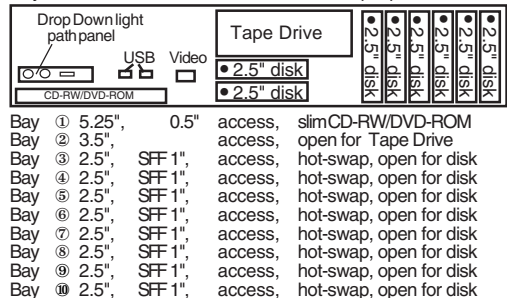
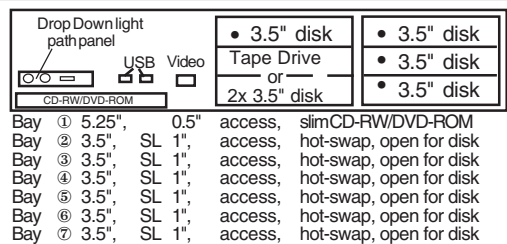
Max internal disk capacity:
 3.5" SAS models: 1.8TB² with six 300GB SL disks
 3.5" SATA models: 4.5TB² with six 750GB disks
 2.5" SAS models: 1.2TB² with eight 146GB SFF disks

See footnotes for important warranty information

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-JAY-JAX	1 x Xeon™ L5310 1.6GHz	QC 8MB	2GB	2.5" Open	SAS/SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	May 2007
7979-JBY-JBX	1 x Xeon L5325 1.86GHz	QC 8MB	2GB	2.5" Open	SAS/SATA	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	May 2007

Positioning Processor	2U Rack with 3.5" SAS or SATA with high availability, scalability and expandability for application-serving Web environments Up to 1x Intel® Xeon Processor 1.86GHz with 1066MHz FSB / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST)
L2 cache SMP support Implementation	8MB / std and max / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers
Memory	2GB std / 48GB ¹³ max / two slots used / ten slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill
SAS/SATA controller	Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported
SAS connectors IDE controller/cable Disk - capacity Disk - bays Tape backup	One internal connection wired to DASD backplane / one external connector Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM) None standard / supports 7200-15000 rpm disks / one backplane Some: six hot-swap 3.5" SAS or SATA HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in open bays Optional internal and external / 3.5" / USB or SATA
Mechanical Chipset	EIA 19" Rack (2U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots	(See below) Four PCI-Express x8 or two PCI-X 1.0 and two PCI-Express x8 / no hot-swap Active™ PCI slots
Ethernet controller	Dual gigabit 10/100/1000 ethernet ports / Two Broadcom® 5708 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette Front & Rear ports	8X-24X ⁶ CD-RW/DVD-ROM / USB only Front: two USB (Vers 2.0), graphics (DB-15) Rear: four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port
Graphics	SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3
Security Systems mgmt	Power-on password / administrator password / unattended boot / selectable boot sequence IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

Diagnostics	Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)	Xeon L5310 1.6GHz/1066MHz/8MB L2 Cache	43W5918
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon L5325 1.86GHz/1066MHz/8MB L2 Cache	43W5919
Keyboard / mouse	None standard (because rack-based) / USB only	1GB PC2-5300 FBD (2 x 512 MB)	39M5782
Power supply	Std/Max: one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	2GB PC2-5300 FBD (2 x 1GB)	39M5785
Fans	Calibrated Vectored Cooling™ Std: five fans; Max: ten (five fans with optional second power supply) / redundant with ten fans installed; All: variable speed / hot-swap / PFA	4GB PC2-5300 FBD (2 x 2GB)	39M5791
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	8GB PC2-5300 FBD (2 x 4GB)	39M5797
		IBM ServeRAID-8k Adapter	25R8064
		IBM Remote Supervisor Adapter II Slim	39Y9566
		500GB 7.2K rpm SATA hot-swap 300MB/sec	39M4530
		750GB HS SATA HDD	43W7576
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
		835 Watt Hot-swap Power Supply Option (US)	40K1905
		PCI Riser Card PCI-X Option	40K1908
		Other options at ibm.com/products/us	



Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 133MHz 3.3v PCI-X
Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 133MHz 3.3v PCI-X
Slot 3: low-profile, PCI-Express x8(x4 Links)
Slot 4: low-profile, PCI-Express x8(x4 Links)
*slots 1 & 2 riser determines PCI-Express or PCI-X

See footnotes for important warranty information

Max internal disk capacity:
3.5" SAS models: 1.8TB² with six 300GB SL disks
3.5" SATA models: 4.5TB² with six 750GB disks
2.5" SAS models: 1.2TB² with eight 146GB SFF disks

- ↳ Quick release adapter slots (no screws)
- ↳ Configuration/Setup Utility: F1 at startup
- ↳ Diagnostics (PC-Doctor™): F2 at startup
- ↳ Network Boot: F12 at startup
- ↳ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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 65 pounds
- ↳ Stealth black color

LIMITED WARRANTY³

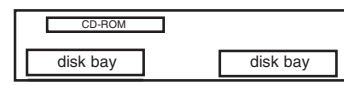
- ↳ 3 year parts and labor
- ↳ International Warranty Service³
- ↳ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↳ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (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

IBM® Type-model	Qty x Processor	L2 cache	Memory	Ultra320 SCSI disk	SCSI controller	Mechanical	Slots x bays	Disk Bays	Alarm Panel	Power supply	Compliant	Available date
7980-51X	2 x Xeon™ 3.2GHz	2MB	2GB	Open	2 x Ultra320	2U ⁴ rack	6x3	2 HS	Yes	DC power	NEBS-3	Aug 2006
7980-52X	2 x Xeon 3.2GHz	2MB	1GB	Open	2 x Ultra320	2U rack	6x3	2 HS	Yes	DC power	NEBS-3	May 2006
7980-53X	2 x Xeon 3.2GHz	2MB	2GB	Open	2 x Ultra320	2U rack	6x3	2 HS	Yes	AC power		May 2006
7980-54X	2 x Xeon 3.2GHz	2MB	2GB	2 x 146.8GB ² 10K	2 x Ultra320	2U rack	6x3	2 HS	Yes	DC power	NEBS-3	May 2006
7980-55X	2 x Xeon 3.2GHz	2MB	2GB	2 x 146.8GB 10K	2 x Ultra320	2U rack	6x3	2 HS	Yes	DC power		May 2006

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

Positioning	<i>High performance, carrier grade reliability for providers of the Next Generation Network</i>											
Processor(s)	2 x Intel® Xeon 3.2GHz with 800MHz FSB / Optimized for Extended Memory 64 Technology™ (EM64T) / Hyper-Threading											
L2 cache	2MB std and max / ECC / at processor speed											
Implementation	Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, six DIMM sockets, two PCI riser connectors, and integrated subsystems											
SMP support	2-way SMP via second identical processor is standard											
Memory	Up to 2GB std / 16GB¹³ max / PC2-3200 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / Six DIMM gold-connector slots on systemboard / Two sockets used / Four sockets available / ships with two 512 GB or 1GB DIMMs / DIMMs must be installed in matched pairs [a bank] / two-way memory interleave / dual-channel / Error Checking and Correcting (ECC) / Active Memory™ : online spare and memory mirror / Chipkill™ supported											
SCSI disk controller	LSI® LSI53C1030 / Ultra320 SCSI controller (LVD 320MB/sec) / dual-channel / on planar / 64-bit PCI / Fusion-MPT™ architecture											
SCSI channels	SCSI Channel A: one internal 16-bit 80-pin LVD cable from controller to two-bay disk drive carrier SCSI Channel B: external 16-bit 8mm VHDCI 68-pin external connector (no cables)											
SCSI disk	Up to two 146.8GB Ultra320 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T. ⁵ / RAID 0 and 1											
SCSI disk bays	Two hot-swap disk bays in disk drive carriers that slides out from front											
IDE controller / cable	EIDE ATA-100 controller / Disk Bridge / one connector on planar / one 1-drop IDE cable (to CD-DVD 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 (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											
PCI bus slots	Intel® E7520 chipset / Intel Memory Controller Hub (MCH) / E7520 North Bridge / PXH I/O bridge / ICH-5R S South Bridge / 3 PCI buses (one 64-bit/100MHz PCI-X supporting: SCSI and full-length PCI riser board, one 64-bit/100MHz PCI-X supporting: Ethernet and low-profile PCI riser board and one 32-bit/33MHz PCI supporting graphics) / LPC bus for NS PC87431M for mBMC and NS PC87427 for Super I/O (serial, keyboard, mouse)											
Chipset												
Bays	(See diagram below): 3 bays / two disk bays (hot-swap) / one peripheral drive bay											
Ethernet	Dual Gigabit 10/100/1000 ethernet ports / Intel 82546 / on planar / full-duplex / supports Wake on LAN®, PXE 3.0 Boot Agent, Adapter Fault Tolerance, Failover											
DVD-ROM / diskette	24X-10X ⁶ slim-line CD-DVD ROM / USB only											
Ports	Rear: Two USB ports (Ver 2.0); RJ-45 serial; combo keyboard and mouse; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port Front: One USB (Ver 2.0); RJ-45 serial											
Graphics controller	SVGA / PCI bus / ATI® Rage XL (on planar) / 16MB SDRAM std/max / 1600x1200 at 16M colors at 85Hz / DB-15											
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 /											
OS support	Microsoft® Windows™ Server 2003, Enterprise Edition / Red Hat® Enterprise Linux 3 & 4 AS / SUSE® Linux Enterprise Server 9											
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)											
Power supply	Std/Max: two / rear accessible / AC 600 watt (220V) or DC 600 watt (-48 to -60 V dc) / supports dual input sources / (1+1) redundant / hot-swap / auto-restart support											
Fans	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each processor											
Prerequisites	Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system											

Options available via special Bid



2U Rack

- Slot 1: fullsize, 64-bit 100MHz PCI-X (5V)
- Slot 2: fullsize, 64-bit 100MHz PCI-X (5V)
- Slot 3: fullsize, 64-bit 100MHz PCI-X (5V)
- Slot 4: low-profile, 64-bit 133MHz PCI-X (3.3V)
- Slot 5: low-profile, 64-bit 133MHz PCI-X (3.3V)
- Slot 6: low-profile, 64-bit 133MHz PCI-X (3.3V)
- Bay ② 3.5", 0.5", access, std CD-DVD ROM
- Bay ③ 3.5", SL 1", access, some std disk
- Bay ④ 3.5", SL 1", access, some std 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)

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

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

See footnotes for important warranty information
US model announced April 25, 2006

IBM® Type-model	Qty x Processor	Speed/Core	L2 Cache	Optical	Memory	Disk / Controller	Disk bays	Slots x bays	Ethernet	Warranty ³ (years)	Available date
7985 - 11U	1 x Opteron™ 2210	1.8GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS	8-2.5"HS	4x10	Dual Gigabit	3	Nov 2006
7985 - 1AU	1 x Opteron 2210	1.8GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS/SATA	6-3.5"HS	4x7	Dual Gigabit	3	Nov 2006
7985 - 21U	1 x Opteron 2212	2.0GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS	8-2.5"HS	4x10	Dual Gigabit	3	Nov 2006
7985 - 2AU	1 x Opteron 2212	2.0GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS/SATA	6-3.5"HS	4x7	Dual Gigabit	3	Nov 2006
7985 - 41U	1 x Opteron 2216	2.4GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS	8-2.5"HS	4x10	Dual Gigabit	3	Nov 2006
7985 - 4AU	1 x Opteron 2216	2.4GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS/SATA	6-3.5"HS	4x7	Dual Gigabit	3	Nov 2006
7985 - 51U	1 x Opteron 2218	2.6GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS	8-2.5"HS	4x10	Dual Gigabit	3	Nov 2006
7985 - 5AU	1 x Opteron 2218	2.6GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS/SATA	6-3.5"HS	4x7	Dual Gigabit	3	Nov 2006

Positioning
Processor(s) Rack-optimized, dual-socket, dual-core business performance server
 Up to two AMD® Opteron 2000 Series Dual Core Processors up to 2.6GHz¹ / simultaneously supports 32-bit and 64-bit computing
L2 cache 1MB / per core / at processor speed
SMP support 2-way SMP / up to two Opteron Processors (same speed/cache size required)
Implementation Systemboard contains two AM2 sockets, sixteen memory DIMM slots, integrated SAS & SATA, dual ethernet, graphics, one PCI-E x4 slot, two PCI-E x8 slots and one HyperTransport (HTx) slot via riser card

Memory 1 GB std / 32GB max¹³ per processor (64GB max per dual cpu system) / single cpu system: two slots used, six slots available; dual cpu system: four slots used, twelve slots available / PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs / sixteen DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / Error Checking and Correcting (ECC) via 16-bit Checksum / Chipkill™ on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

SAS controller Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS (300MB/sec SAS) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector)

SAS connectors One internal connection wired to DASD backplane
SATA disk controller Integrated SATA II controller / provided by HT1000 South Bridge / four port
IDE controller/cable Enhanced IDE/ATA 100 controller integrated in South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: six hot-swap 3.5" SAS HDD (4 3.5" HDD bays w/tape option) / some: eight hot-swap 2.5" SAS HDD / filler panels installed in each disk bay
Tape backup Optional internal and external / 3.5" / USB or SATA

Mechanical EIA 19" Rack (2U*) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Chipset ServerWorks™ Chipset / HT2100 System I/O Controller provides: two PCI-Express x8 slot, one PCI-Express x4 slot, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: PCI-X, USB(2.0), ATI video, SATA, Dual GB ethernet, IDE and LPC bus to NS PC87427 for Super I/O

Bus slots (See detail below) one full-height, full-length HTx, two low profile PCI-E x8 and one low profile PCI-E x4 / option to convert HTx to PCI-X or PCI-E x16 slot

Ethernet Two gigabit 10/100/1000 ethernet ports / Broadcom® 5706 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / TCP/IP offload engine (TOE) / full duplex / Wake on LAN® / two rear RJ-45 ports

Optical / diskette 24x/10x/24x/8x CD-RW/DVD / IDE / Diskette none (USB diskette optional)
Ports Front: two USB (Vers 2.0), DB-15 graphics / Rear: four USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45), system management (RJ-45), analog DB-15 graphics / parallel port not supported

Graphics SVGA / ATI® ES1000(RN50b) / on planar / 16MB SDRAM std/max
Keyboard / mouse None standard (because rack-based) / USB only

Security Power-on and administrator passwords / unattended boot / selectable boot
Systems mgmt IBM Integrated Baseboard Management Controller (BMC) / H82166 / IPMI 2.0 / IBM PowerExecutive™

Diagnostics Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)

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

Power supply Std/Max: one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing
Fans Calibrated Vectored Cooling™ Std: five fans; Max: ten (five fans with optional second power supply) / redundant with ten fans installed; All: variable speed / hot-swap / PFA

Prerequisites Monitor, keyboard, mouse, disk, rack, OS

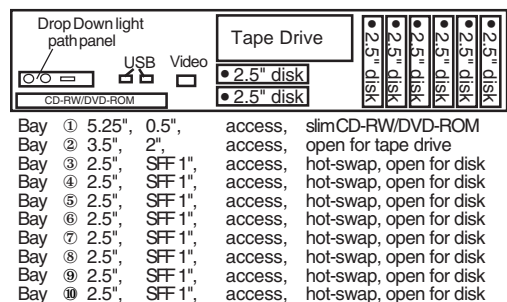
Dual Core AMD Opteron Processor Model 2210	25R8938
Dual Core AMD Opteron Processor Model 2212	25R8939
Dual Core AMD Opteron Processor Model 2216	25R8940
Dual Core AMD Opteron Processor Model 2218	40K1212
1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2759
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2762
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2765
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2768
IBM 73GB 10K 3.5" SAS Hot-Swap HDD*	40K1039
IBM 146GB 10K 3.5" SAS Hot-Swap HDD*	40K1040
IBM 300GB 10K 3.5" SAS Hot-Swap HDD*	40K1041
IBM 36GB 15K 3.5" SAS Hot-Swap HDD*	40K1042
IBM 73GB 15K 3.5" SAS Hot-Swap HDD*	40K1043
IBM 146GB 15K 3.5" SAS Hot-Swap HDD*	40K1044
IBM 36GB 15K SAS SFF Hot-Swap HDD*	40K1051
IBM 73GB 15K SAS SFF Hot-Swap HDD*	40K1052
IBM 500GB 7.2K 3.5" SATA Hot-Swap HDD*	39M4530
IBM 750GB 3.5" SATA Hot-Swap HDD*	43W7576
IBM SAS HBA Controller	25R8060
PCI-E x16 Riser Card	40K7428
PCI-X Riser Card	40K7427
IBM Remote Supervisor Adapter II Slimline	39Y9566
IBM ServeRAID 8k SAS Controller	25R8064
Qlogic Infinipath HTx Infiniband Adapter	41Y4519
835W Redundant Power Supply (US)	40K1905

Other options at ibm.com/products/us

- H 1.72" x W 17.3" x D 25.7" (H 43.7mm x W 439.9mm x D 653.3mm)
- 26 to 32 pounds
- Stealth black color
- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- Network Boot: F12 at startup

- Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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

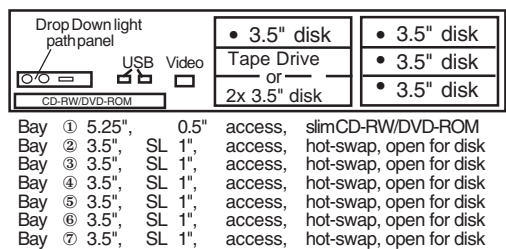
2U Rack with 2.5" SAS



Bay ① 5.25", 0.5", access, slim CD-RW/DVD-ROM
 Bay ② 3.5", 2", access, open for tape drive
 Bay ③ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ④ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ⑤ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ⑥ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ⑦ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ⑧ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ⑨ 2.5", SFF 1", access, hot-swap, open for disk
 Bay ⑩ 2.5", SFF 1", access, hot-swap, open for disk

Maximum internal disk capacity¹³:
 4.5TB with six 750GB SATA disks or ● = Hot-swap (HS)
 1.8TB with six 300GB SAS disks

2U Rack with 3.5" SAS/SATA



Slot 1: Riser slot for PCI-Express x16(x16 Links), 64-bit 133MHz 3.3v PCI-X or HTx risers
 Slot 2: low-profile, PCI-Express x8(x4 Links)
 Slot 3: low-profile, PCI-Express x8(x8 Links)
 Slot 4: low-profile, PCI-Express x8(x8 Links)

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
 - 1 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9403)
 - 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2123)
 - 2 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2124)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2078)
 - 3 year IOR 9x5, NBD response (ServicePac part num 69P9258)
- Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

IBM® Type-model	Qty x Processor	Speed/Core	L2 Cache	Optical	Memory	Disk / Controller	Disk bays	Slots x bays	Ethernet	Warranty ³ (years)	Available date
7985 -12U	1 x Opteron™ 2210HE	1.8GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS	8-2.5"HS	4x10	Dual Gigabit	3	Mar 2007
7985 -1BU	1 x Opteron 2210HE	1.8GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS/SATA	6-3.5"HS	4x7	Dual Gigabit	3	Mar 2007
7985 - 61U	1 x Opteron 2220	2.8GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS	8-2.5"HS	4x10	Dual Gigabit	3	Mar 2007
7985 - 6AU	1 x Opteron 2220	2.8GHz/DC	2x1MB	CD-RW/DVD	2x512MB	Open/SAS/SATA	6-3.5"HS	4x7	Dual Gigabit	3	Mar 2007

Positioning
Processor(s)
L2 cache
SMP support
Implementation

Rack-optimized, dual-socket, dual-core business performance server
 Up to two AMD® Opteron 2000 Series Dual Core Processors up to 2.8GHz¹ / simultaneously supports 32-bit and 64-bit computing
1MB / per core / at processor speed
2-way SMP / up to two Opteron Processors (same speed/cache size required)
 Systemboard contains two AM2 sockets, sixteen memory DIMM slots, integrated SAS & SATA, dual ethernet, graphics, one PCI-E x4 slot, two PCI-E x8 slots and one HyperTransport (HTx) slot via riser card

Memory

1 GB std / 32GB max¹³ per processor (64GB max per dual cpu system) / *single cpu system: two slots used, six slots available; dual cpu system: four slots used, twelve slots available* / **PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs** / sixteen DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / **Error Checking and Correcting (ECC)** via 16-bit Checksum / **Chipkill™** on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

SAS controller
SAS connectors
SATA disk controller
IDE controller/cable
Disk - capacity
Disk - bays
Tape backup

Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS (300MB/sec SAS) / hot-swap / on planar / PCI-Express / supports **RAID 0, 1 & 10** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector)
 One internal connection wired to DASD backplane
Integrated SATA II controller / provided by HT1000 South Bridge / four port
 Enhanced IDE/ATA 100 controller integrated in South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM)
 None standard / supports 7200-15000 rpm disks / one backplane
 Some: six hot-swap 3.5" SAS HDD (4 3.5" HDD bays w/tape option) / some: eight hot-swap 2.5" SAS HDD / filler panels installed in each disk bay
 Optional internal and external / 3.5" / USB or SATA

Mechanical
Chipset
Bus slots
Ethernet
Optical / diskette
Ports
Graphics
Keyboard / mouse

EIA 19" Rack (2U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
ServerWorks™ Chipset / HT2100 System I/O Controller provides: two PCI-Express x8 slot, one PCI-Express x4 slot, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: PCI-X, USB(2.0), ATI video, SATA, Dual GB ethernet, IDE and LPC bus to NS PC87427 for Super I/O
 (See detail below) one full-height, full-length HTx, two low profile PCI-E x8 and one low profile PCI-E x4 / option to convert HTx to PCI-X or PCI-E x16 slot
 Two gigabit 10/100/1000 ethernet ports / Broadcom® 5706 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / TCP/IP offload engine (TOE) / full duplex / Wake on LAN® / two rear RJ-45 ports
 24x/10x/24x/8x CD-RW/DVD / IDE / *Diskette* none (USB diskette optional)
Front: two USB (Vers 2.0), DB-15 graphics / *Rear:* four USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45), system management (RJ-45), analog DB-15 graphics / parallel port not supported
 SVGA / ATI® ES1000(RN50b) / on planar / 16MB SDRAM std/max
 None standard (because rack-based) / USB only

Dual Core AMD Opteron Processor Model 2210HE	43W7271
Dual Core AMD Opteron Processor Model 2220	43W7220
1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2759
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2762
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2765
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2768
IBM 73GB 10K 3.5" SAS Hot-Swap HDD*	40K1039
IBM 146GB 10K 3.5" SAS Hot-Swap HDD*	40K1040
IBM 300GB 10K 3.5" SAS Hot-Swap HDD*	40K1041
IBM 36GB 15K 3.5" SAS Hot-Swap HDD*	40K1042
IBM 73GB 15K 3.5" SAS Hot-Swap HDD*	40K1043
IBM 146GB 15K 3.5" SAS Hot-Swap HDD*	40K1044
IBM 36GB 15K SAS SFF Hot-Swap HDD*	40K1051
IBM 73GB 15K SAS SFF Hot-Swap HDD*	40K1052
IBM 500GB 7.2K 3.5" SATA Hot-Swap HDD*	39M4530
IBM 750GB 3.5" SATA Hot-Swap HDD*	43W7576
IBM SAS HBA Controller	25R8060
PCI-E x16 Riser Card	40K7428
PCI-X Riser Card	40K7427
IBM Remote Supervisor Adapter II Slimline	39Y9566
IBM ServeRAID 8k SAS Controller	25R8064
Qlogic Infinipath HTx Infiniband Adapter	41Y4519
835W Redundant Power Supply (US)	40K1905

Other options at ibm.com/products/us

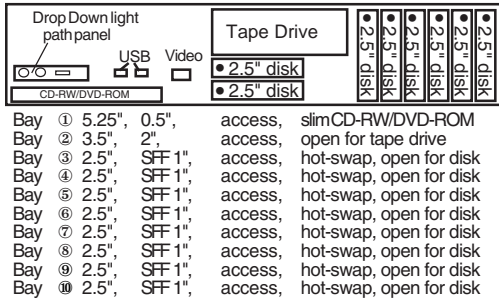
Security
Systems mgmt
Diagnostics
Software
Power supply
Fans
Prerequisites

Power-on and administrator passwords / unattended boot / selectable boot
IBM Integrated Baseboard Management Controller (BMC) / H82166 / IPMI 2.0 / **IBM PowerExecutive™**
Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel)
ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others
Std/Max: one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing
Calibrated Vectored Cooling™ *Std:* five fans; *Max:* ten (five fans with optional second power supply) / redundant with ten fans installed; *All:* variable speed / hot-swap / PFA Monitor, keyboard, mouse, disk, rack, OS

- H 1.72" x W 17.3" x D 25.7" (H 43.7mm x W 439.9mm x D 653.3mm)
- 26 to 32 pounds
- Stealth black color
- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- Network Boot: F12 at startup

- Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system 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

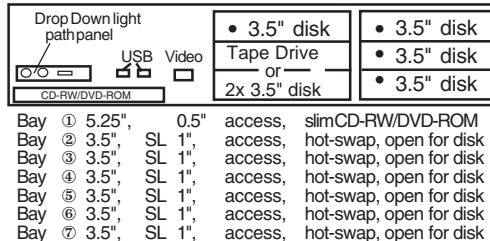
2U Rack with 2.5" SAS



Maximum internal disk capacity¹³:
 4.5TB with six 750GB SATA disks or
 1.8TB with six 300GB SAS disks

• = Hot-swap (HS)

2U Rack with 3.5" SAS/SATA



Slot 1: Riser slot for PCI-Express x16(x16 Links), 64-bit 133MHz 3.3v PCI-X or HTx risers
 Slot 2: low-profile, PCI-Express x8(x4 Links)
 Slot 3: low-profile, PCI-Express x8(x8 Links)
 Slot 4: low-profile, PCI-Express x8(x8 Links)

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**
 - 1 year IOR 9x5, 4 hr avg response (ServicePac³ part num 69P9403)
 - 2 year IOR 24x7, 4 hr avg response (ServicePac³ part num 96P2123)
 - 2 year IOR 24x7, 2 hr avg response (ServicePac³ part num 96P2124)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac³ part num 21P2078)
 - 3 year IOR 9x5, NBD response (ServicePac³ part num 69P9258)
- **Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7¹⁴ toll-free support for warranty issues during the warranty period⁵**

IBM® Type-model	Qty x Processor	Speed/Core	L2 cache	Watts	CPU/Memory cards	Memory	DIMM slots	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8877-1RY	1 x Opteron™ 8212	2.0GHz/DC	2MB	95W	One	2x512MB	8	SAS	4U ⁴ rack	7x5	1 x 1500W	3	Sep 2006
8877-2RY	1 x Opteron 8214	2.2GHz/DC	2MB	95W	One	2x512MB	8	SAS	4U rack	7x5	1 x 1500W	3	Sep 2006
8877-4RY	2 x Opteron 8218	2.6GHz/DC	2MB	95W	Two	4x1GB	16	SAS	4U rack	7x5	1 x 1500W	3	Sep 2006
8877-5RY	2 x Opteron 8220 SE	2.8GHz/DC	2MB	120W	Two	4x1GB	16	SAS	4U rack	7x5	1 x 1500W	3	Sep 2006
8877-3RY	1 x Opteron 8216	2.4GHz/DC	2MB	95W	One	2x512MB	8	SAS	4U rack	7x5	1 x 1500W	3	Apr 2007
8877-5SY	2 x Opteron 8220	2.8GHz/DC	2MB	95W	One	4x1GB	8	SAS	4U rack	7x5	1 x 1500W	3	Apr 2007
8877-6RY	2 x Opteron 8222 SE	3.0GHz/DC	2MB	120W	One	4x1GB	8	SAS	4U rack	7x5	1 x 1500W	3	May 2007
8677-E4U	2 x Opteron 8218	2.6GHz/DC	2MB	95W	One	4x2GB	8	SAS	4U rack	7x5	1 x 1500W	3	Apr 2007

Positioning Processors L2 cache Processor upgrade Implementation **Up to 4-way, high performance server with maximum memory availability and superior performance per watt**
Up to two AMD® Opteron 8000 Series Dual Core Processor up to 3.0GHz⁷ / simultaneously supports 32-bit and 64-bit computing
1MB / per core / at processor speed
4-way SMP / up to four Opteron Processors (same speed/cache size) / Dual Core Capable
System board contains four CPU/Memory Card Connectors, one HTx slot, four PCI-Express slots, two PCI-X slots, one dedicated slot for optional RSA II daughter card and integrated SAS, dual ethernet, graphics

Active Memory™ **1, 4 or 8GB** std / 32GB max per processor (128GB max per chassis using four cpu/memory cards) / one cpu/memory card standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs / two-way interleaving / **Error Checking and Correcting (ECC)** via 16-bit Checksum / **Xcelerated Memory Technology™ / Chipkill™** on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

SAS disk controller **Adaptec® AIC-9580W** SAS controller (3Gb/sec) / dual channel / four port / on planar / PCI-Express / **RAID 0, 1 & 10** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SAS connectors One internal connection wired to DASD backplane
IDE controller / cabling Enhanced IDE ATA-100 controller integrated in South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity Supports up to 300GB 10K rpm disks
Disk - bays **Four 3.5"** hot-swap bays / converged tray / SAS connectors
Mechanical **EIA 19" Rack (4U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion

Chipset **ServerWorks™ Chipset** / Two HT2100 PCI-Express Host Bridges / **HT2100A** provides: one PCI-Express x8 slot, one PCI-Express x4 slot, PCI-Express bridge to Adaptec SAS, PCI-Express bridge to Dual GB ethernet and HyperTransport bridge to HT1000 South Bridge / **HT2100B** provides: one PCI-Express x16 slot and one PCI-Express x8 slot / **HT1000 South Bridge** provides: two PCI-X 1.0 slots at up to 64-bit/133MHz, USB(2.0), ATI video, IDE and LPC bus to NS PC87427 for Super I/O
Bus Slots (See below) Four total PCI-Express / two PCI-X at up to 133 MHz / one HTx / one dedicated slot for optional RSA II daughter card

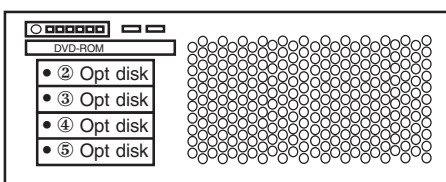
DVD-ROM / diskette Ethernet **8X⁶ Slim DVD-ROM** / none
Dual Broadcom® 5708C 10/100/1000 ethernet controllers / on systemboard / two full gigabit ethernet MAC and PHY layer functions / PCI-Express / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear
XVGA / ATI® RN50(ES1000) / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Graphics controller Ports Rear: RSA ethernet, RSA serial, one USB(2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial RS-485 / Front: two USB (2.0)

Security Systems mgmt Power-on and administrator passwords / unattended boot / selectable boot
BMC standard / IPMI 2.0 / **PowerExecutive™ / Remote Supervisor Adapter II Slimline** optional (std on E4U) / PCI adapter / includes 10/100 ethernet 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 1500 watt hot-swap(240 VAC); Max: two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA

Cooling fans **Calibrated Vektored Cooling™** Std: three fans; Max: six / hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and management processor / redundant fan kit required for three or more processors

Dual Core AMD Opteron Processor Model 8212	40K1200
Dual Core AMD Opteron Processor Model 8214	40K1201
Dual Core AMD Opteron Processor Model 8216	43W7244
Dual Core AMD Opteron Processor Model 8218	40K1202
Dual Core AMD Opteron Processor Model 8220	43W7246
Dual Core AMD Opteron Processor Model 8220SE	40K1203
Dual Core AMD Opteron Processor Model 8222SE	43W7247
1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2759
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2762
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2765
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2768
IBM 73GB 10K HS 3.5" SAS HDD	40K1039
IBM 146GB 10K HS 3.5" SAS HDD	40K1040
IBM 300GB 10K HS 3.5" SAS HDD	40K1041
IBM ServeRAID 8k SAS Controller	25R8064
1500W US Power Supply	40K7543
Redundant Fan Kit - 3 Fans	40K7545
Processor Pass Thru Card	40K7547
IBM RSA II slimline	39Y9566
Other options at ibm.com/products/us	



Max BTU Output:
Ship Config: 409 Btu/hr (120 watts)
Full Config: 1366 Btu/hr (400 watts)

- ⊖ Dimensions: H7" x W19" x D28"
- ⊖ Dimensions: H178mm x W483mm x D711mm
- ⊖ Weight: 26 to 32lbs; 11.8 to 14.6kg
- ⊖ 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
- ⊖ 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 DVD-ROM
Bay ② 3.5", SL 1", access, hot-swap, open
Bay ③ 3.5", SL 1", access, hot-swap, open
Bay ④ 3.5", SL 1", access, hot-swap, open
Bay ⑤ 3.5", SL 1", access, hot-swap, open

Available expansion slots:
Slot 1 - fullsize, PCI-Express x16
Slot 2 - fullsize, PCI-Express x8
Slot 3 - fullsize, PCI-Express x8
Slot 4 - fullsize, PCI-Express x4
Slot 5 - fullsize, 64-bit, PCI-X 1.0, 100/133MHz*
Slot 6 - fullsize, 64-bit, PCI-X 1.0, 100/133MHz*
RSA slot - supports RSA II slimline adapter
*If one PCI-X 133MHz card is plugged into slot 6 and slot 5 is empty, then it will run at 133MHz. If one PCI-X 133 MHz card is plugged into slot 5 and 6 is empty, then it will run at 100MHz. If two 133MHz cards are plugged into slots 5 and 6, they will run at 100MHz

All models: Maximum internal disk capacity: 1.2TB with four 300GB² hot-swap SAS 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, 4 hr avg response 69P9507
 - 3 year IOR 24x7, 2 hr avg response 69P9508
 - 1 year IOR 9x5, NBD response 69P9398
 - 2 year IOR 9x5, NBD response 96P2117
- ⊖ 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 Core cache	Memory	DIMM slots	Memory Cards	Disks	Disk Controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8865-13U	1 x Xeon™ MP 3.16GHz	SC 1MB	1GB(2x512MB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-1TU	1 x Xeon MP 3.16GHz	SC 1MB	1GB(2x512MB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006
8865-22U	1 x Xeon MP 3.66GHz	SC 1MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-2TU	1 x Xeon MP 3.66GHz	SC 1MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006
8865-32U	1 x Xeon MP 7020 2.67GHz	DC 2MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-3TU	1 x Xeon MP 7020 2.67GHz	DC 2MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006
8865-42U	1 x Xeon MP 7040 3.0GHz	DC 4MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-4TU	1 x Xeon MP 7040 3.0GHz	DC 4MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006

Processors One 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 2MB / per core / 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, four memory board slots, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics

Active Memory™ 1 or 2GB std / 64GB max per chassis using high-capacity memory card / one memory card 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™)

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 EA 19" rack models (7U) 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
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 support up to 266MHz

DVD-ROM / diskette IBM SlimLine DVD-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 / IPMI 2.0 / 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	1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	39M5821	IBM ServeRAID™-8i SA-SCSI Adapter	39R8729
	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809	IBM ServeRAID 6M U320 256MB Adapter	02R0988
	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	40K1039
	Active Memory 4-slot Expansion Card	41Y5000	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
	Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	40K2521	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
	Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	40K2520	Remote Supervisor Adapter II Slimline	39Y9566
	Xeon MP 7020 2.67GHz Proc Upg	40K2522	SAS 3.5" 6-drive Backplane	41Y5003
	Xeon MP 7040 3.0GHz Proc Upg	40K2523	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	40K1043
	Dual Core X3 Upgrade kit(no procs included)	41Y5005	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	40K1044
	775 watt Hot-Swap Power Supply (WW)	41Y5002		

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 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/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

Light Path Diag **7U⁴ Rack or Tower**

Removable Processor Board Tray

• Opt disk	• Opt disk	Floppy Drive
• Opt disk	• Opt disk	CD-ROM
• Opt disk	• Opt disk	Full High Tape Bay
• Opt disk	• Opt disk	or 2 Half High Bays
• Opt disk	• Opt disk	

- ↪ 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: 1,170 Btu/hr (343 watts)
 Full Config: 6,142 Btu/hr (1800 watts)

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

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory Cards	RSA II	Disk Controller	Mechanical	Slots x bays	Power Supplies	Warranty (yrs.)	Available date
8866-11U	1 x Xeon™ MP 7110N 2.5GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	Tower	6x12	2 x775W	3	Nov 2006
8866-1RU	1 x Xeon MP 7110N 2.5GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	7U Rack	6x12	2 x775W	3	Nov 2006
8866-21U	1 x Xeon MP 7120N 3.0GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	Tower	6x12	2 x775W	3	Nov 2006
8866-2RU	1 x Xeon MP 7120N 3.0GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	7U Rack	6x12	2 x775W	3	Nov 2006
8866-31U	1 x Xeon MP 7130N 3.16GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	Tower	6x12	2 x775W	3	Nov 2006
8866-3RU	1 x Xeon MP 7130N 3.16GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	7U Rack	6x12	2 x775W	3	Nov 2006
8866-41U	2 x Xeon MP 7140N 3.30GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS	Tower	6x12	3 x775W	3	Nov 2006
8866-4RU	2 x Xeon MP 7140N 3.30GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS	7U Rack	6x12	3 x775W	3	Nov 2006

Processors Up to two 64-bit Intel® Xeon™ Processor MP up to 3.30GHz¹ 667MHz FSB Dual Core / one 64-bit Intel Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading 1MB / per core / on die of processor / at processor speed / Xcel4v™ Dynamic Server Cache

L2 cache 4MB on 7110N & 7120N / 8MB on 7130N / 16MB on 7140N

L3 cache 4MB on 7110N & 7120N / 8MB on 7130N / 16MB on 7140N

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, four memory board slots, four Active™ PCI-E x8 slots, two Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics

Active Memory™ 2 or 4GB std / 64GB max per chassis using high-capacity memory card / up to two memory cards standard (max of 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™)

SAS disk controller All: Adaptec® AIC-9410 / Dual-channel Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / Some: ServeRAID™ 8i / RAID 0,1, 10, 5, 6, 60, 1E & 5EE / std on 41U & 4RU / dedicated slot / 64-bit 133MHz PCI-X / optional on others

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 EA 19" rack models (7U⁴) 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-E x8 slots

I/O Slots Four Active™ PCI-E x8 slots / full height, full length / Two Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optional sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers

DVD-ROM / diskette IBM SlimLine DVD-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(2.0), kybd, mouse, DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (2.0)

Security Power-on and administrator passwords / unattended boot / selectable boot

Systems management BMC standard / IPMI 2.0 / Remote Supervisor Adapter II slimline (std on 41U & 4RU) / 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 / optional on others

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 Some: two; some: three / 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)	39M5821	IBM ServeRAID 8i SAS Adapter	39R8729
	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809	IBM ServeRAID 6M U320 256MB Adapter	39R8816
	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	40K1039
	Active Memory 4-slot Expansion Card	41Y5000	IBM 146GB 10K 3.5" SAS Hot-swap HDD	40K1040
	Xeon 7110N 2.5GHz/4MB L3/Dual Core Proc	40K1259	IBM 300GB 10K 3.5" SAS Hot-swap HDD	40K1041
	Xeon 7120N 3.0GHz/4MB L3/Dual Core Proc	40K1260	Remote Supervisor Adapter II Slimline	39Y9566
	Xeon 7130N 3.16GHz/8MB L3/Dual Core Proc	40K1261	SAS 3.5" 6-drive Backplane	41Y5003
	Xeon 7140N 3.3GHz/16MB L3/Dual Core Proc	40K1262	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	40K1043
	775 watt Hot-Swap Power Supply (WW)	41Y5002	IBM 146GB 15K 3.5" SAS Hot-swap HDD	40K1044

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 part num 30L9187)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 31L2723)
 - 4 year IOR 9x5, NBD response (ServicePac part num 69P9218)
 - 5 year IOR 9x5, NBD response (ServicePac part num 69P9222)
- ↪ 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, DVD-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

Light Path Diag **7U⁴ Rack or Tower**

Removable Processor Board Tray

• Opt disk	• Opt disk	Floppy Drive
• Opt disk	• Opt disk	CD-ROM
• Opt disk	• Opt disk	Full High Tape Bay
• Opt disk	• Opt disk	or 2 Half High Bays
• Opt disk	• Opt disk	

- ↪ 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

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

BTU Output:
 Ship Config: 1,170 Btu/hr (343 watts)
 Full Config: 6,142 Btu/hr (1800 watts)

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory Cards	RSA II	Disk Controller	Mechanical	Slots x bays	Power Supplies	Warranty (yrs.)	Available date
8866-51U	2 x Xeon™ MP 7150N 3.5GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS	Tower	6x12	3 x775W	3	Feb 2007
8866-5RU	2 x Xeon MP 7150N 3.5GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS	7U Rack	6x12	3 x775W	3	Feb 2007

Processors	Two 64-bit Intel® Xeon™ Processor MP up to 3.5GHz¹ 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading
L2 cache	1MB / per core / on die of processor / at processor speed / Xcel4v™ Dynamic Server Cache
L3 cache	16MB on 7150N
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, four memory board slots, four Active™ PCI-E x8 slots, two Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics
Active Memory™	2 or 4GB std / 64GB max per chassis using high-capacity memory card / up to two memory cards standard (max of 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™)
SAS disk controller	All: Adaptec® AIC-9410 / Dual-channel Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / Some: ServeRAID™ 8i / RAID 0,1, 10, 5, 6, 60, 1E & 5EE / std on 51U & 5RU / dedicated slot / 64-bit 133MHz PCI-X / optional on others
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 / 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-E x8 slots
I/O Slots	Four Active™ PCI-E x8 slots / full height, full length / Two 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
DVD-ROM / diskette	IBM SlimLine DVD-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(2.0), kybd, mouse, IBM DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	BMC standard / IPMI 2.0 / Remote Supervisor Adapter II slimline (std on 41U & 4RU) / 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 / optional on others
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	Some: two; some: three / 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)	39M5821	IBM ServeRAID 8i SAS Adapter	39R8729
	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809	IBM ServeRAID 6M U320 256MB Adapter	39R8816
	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	40K1039
	8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
	Active Memory 4-slot Expansion Card	41Y5000	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
	Xeon 7150N 3.5GHz/16MB L3/Dual Core Proc	43V4553	Remote Supervisor Adapter II Slimline	39Y9566
	775 watt Hot-Swap Power Supply (WW)	41Y5002	IBM 36GB 15K 3.5" SAS Hot-swap HDD	40K1042
	Tower to Rack conversion kit	32R0719	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	40K1043
	SAS 3.5" 6-drive Backplane	41Y5003	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	40K1044

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 part num 30L9187)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 31L2723)
 - 4 year IOR 9x5, NBD response (ServicePac part num 69P9218)
 - 5 year IOR 9x5, NBD response (ServicePac part num 69P9222)
- ↪ 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, DVD-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

Light Path Diag **7U⁴ Rack or Tower**

Removable Processor Board Tray

• Opt disk	• Opt disk	Floppy Drive
• Opt disk	• Opt disk	CD-ROM
• Opt disk	• Opt disk	Full High Tape Bay
• Opt disk	• Opt disk	or 2 Half High Bays
• Opt disk	• Opt disk	
• Opt disk	• Opt disk	

- ↪ 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

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

BTU Output:
 Ship Config: 1,170 Btu/hr (343 watts)
 Full Config: 6,142 Btu/hr (1800 watts)

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	Disks	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8863-1SY	1 x Xeon™ MP 3.16GHz	SC	1MB	2x1GB	4	One	None	SAS	3U ⁴ rack	6x7	1 x 1300	3	May 2006
8863-2SY	1 x Xeon MP 3.66GHz	SC	1MB	2x1GB	4	One	None	SAS	3U rack	6x7	1 x 1300	3	May 2006
8863-3SY	1 x Xeon 7020 MP 2.67GHz	DC	2x1MB	2x1GB	4	One	None	SAS	3U rack	6x7	1 x 1300	3	May 2006
8863-4SY	1 x Xeon 7040 MP 3.0GHz	DC	2x2MB	2x1GB	4	One	None	SAS	3U rack	6x7	1 x 1300	3	May 2006
8863-E8Y	2 x Xeon MP 3.66GHz	SC	1MB	2x1GB	4	One	None	SAS	3U rack	6x7	2 x 1300	3	May 2006
8863-E9Y	1 x Xeon MP 3.16GHz	SC	1MB	2x1GB	4	One	None	SAS	3U rack	6x7	2 x 1300	3	May 2006
8863-EAY	4 x Xeon 7020 MP 2.67GHz	DC	2x1MB	8x1GB	16	Four	None	SAS	3U rack	6x7	2 x 1300	3	May 2006

Processors Up to two 64-bit Intel® Xeon™ Processor MP up to 3.66GHz¹ 667MHz FSB Single Core / Up to four 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, four memory board slots, six Active™ PCI-X 2.0 slots, and integrated SCSI, ethernet, graphics

Active Memory™ 2GB std / 64GB max per chassis using high-capacity memory card / one memory card 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™)

SAS disk controller Some: Adaptec® AIC-9410 / Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / ServeRaid 8i std on E8Y & EAY / optional on others

SAS connectors Dual channel controller wired to SAS backplane

SAS cabling Two standard SAS cables attached to six-bay backplane

IDE controller / cabling Enhanced IDE ATA-33 controller in CSB6 South Bridge

Disk - capacity 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 support up to 266MHz

DVD-ROM / diskette 8X⁶ 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 BMC standard / IPMI 2.0 / Remote Supervisor Adapter II Slimline std on E8Y & EAY / optional on others / PCI adapter / includes 10/100 ethernet 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 1300 watt hot-swap(240 VAC); Max: two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA

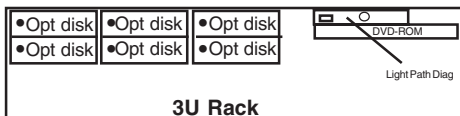
Cooling fans Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	41Y5000
Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	40K2521
Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	40K2520
Xeon MP 7020 2.67GHz/2x1MB L2 Cache Proc Upg	40K2522
Xeon MP 7040 3.0GHz/2x2MB L2 Cache Proc Upg	40K2523
1300 watt Hot-Swap Power Supply (WW)	41Y5001
IBM ServeRAID™-8i SAS-SCSI Adapter	39R8729
IBM ServeRAID 6M U320 256MB Adapter	02R0988
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	40K1051
IBM 73.4GB 10K 2.5" SAS Hot-swap HDD	40K1052
IBM Remote Supervisor Adapter II Slimline	39Y9566
Dual Core X3 upgrade kit	41Y5005
Other options at ibm.com/pc/us/accessories	

Six available 3.3 volt PCI-X 2.0 slots:

- 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



- 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: 1,086 Btu/hr (318 watts)
 Full Configuration: 5,200 Btu/hr (1524 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 processors from front
- Access adapters, power supplies, 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

All models: Maximum internal disk capacity: 440.4GB with six 73.4GB² hot-swap SAS 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, 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® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	RSA II	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8864-1RU	1 x Xeon™ MP 7110N	2.5GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS 3U ⁴ rack	6x7	1 x 1300	3	Oct 2006
8864-2RU	2 x Xeon MP 7120N	3.0GHz	DC	2x1MB	2x1GB	4	One	Std	SAS 3U rack	6x7	1 x 1300	3	Oct 2006
8864-3RU	2 x Xeon MP 7130N	3.16GHz	DC	2x1MB	2x1GB	4	One	Std	SAS 3U rack	6x7	1 x 1300	3	Oct 2006
8864-4RU	2 x Xeon MP 7140N	3.3GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS 3U rack	6x7	2 x 1300	3	Oct 2006
8864-5RU	2 x Xeon MP 7150N	3.5GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS 3U rack	6x7	2 x 1300	3	Feb 2007

Processors Up to two 64-bit Intel® Xeon™ Processor MP up to 3.5GHz/667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading
L2 cache 1 MB / per core / at processor speed / Xcel4™ Dynamic Server Cache
L3 cache 4MB on 7110N & 7120N / 8MB on 7130N / 16MB on 7140N
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, four memory board slots, four Active™ PCI-E x8 slots, two Active™ PCI-X 2.0 slots and integrated SCSI, ethernet, graphics

Active Memory™ 2 or 4GB std / 64GB max per chassis using high-capacity memory card / one or two memory card 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™)

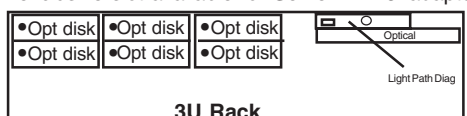
SAS disk controller Some: Adaptec® AIC-9410 / Serial Attached SCSI (SAS) 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0
 Some: ServeRAID™ 8i / RAID 0, 1, 10, 5, 6, 60, 1E & 5EE / std on 4RU & 5RU / dedicated slot / 64-bit 133MHz PCI-X
SAS connectors Dual channel controller wired to SAS backplane
SAS cabling Two standard SAS cables attached to six-bay backplane
IDE controller / cabling Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity 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-E x8 slots
Slots (Active™) Four Active™ PCI-E x8 slots / full height, full length / Two 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
Optical / diskette Most: 8x⁹ DVD ROM / 5RU: 24x/8x⁹ CD-RW/DVD Combo / 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 (2.0), kybd, mouse, DB-15 graphics, two ethernet, std. serial RS-485 / Front: USB (2.0)

Security Power-on and administrator passwords / unattended boot / selectable boot
System management BMC standard / IPMI 2.0 / PowerExecutive™ / Remote Supervisor Adapter II Slimline std on 2RU, 3RU, 4RU & 5RU / optional on 1RU / PCI adapter / includes 10/100 ethernet 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 Some: one; some: two / 1300 watt hot-swap(240 VAC); 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

Two 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
 Four available PCI-E x8 slots:
 Slot 3 - full-height, full-length, PCI-E x8
 Slot 4 - full-height, full-length, PCI-E x8
 Slot 5 - full-height, full-length, PCI-E x8
 Slot 6 - full-height, full-length, PCI-E x8
 *exclusive slot available for ServeRAID 8i adapter



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
 * CD-RW/DVD ROM std on 5RU

- ↳ 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 processors from front
- ↳ Access adapters, power supplies, 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

All models: Maximum internal disk capacity: 440.4GB with six 73.4GB² hot-swap SAS 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, 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® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	Disks	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8872-7RY	2 x Xeon™ MP 7020	2.66GHz	DC 2x1MB	2x1GB	8	Two	None	SAS	3U ⁴ rack	6x7	2 x 1300	3	May 2006
8872-8RY	2 x Xeon MP 7040	3.0GHz	DC 2x2MB	2x1GB	8	Two	None	SAS	3U rack	6x7	2 x 1300	3	May 2006

Processors Two 64-bit Intel® Xeon™ Processor MP up to 3.0GHz¹ 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading technology
L2 cache 1 or 2MB / per core / Xcel4™ Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache None
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, four memory board slots, 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™)

SAS 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
SAS connectors Dual channel controller wired to SAS backplane
SAS cabling Two standard SAS cables 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 (x3950 or x3950 E) 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 support up to 266MHz

DVD-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 / BMC / IMPI 2.0 /

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)

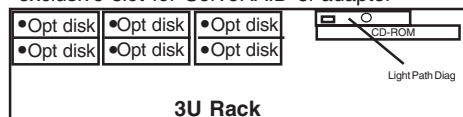
Software **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director

2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	41Y5000
Xeon MP 7020 2.66GHz/2x1MB L2 Proc Upg	40K2522
Xeon MP 7040 3.0GHz/2x2MB L2 Proc Upg	40K2523
IBM ServeRAID™-8i SAS-SCSI Adapter	39R8729
IBM ServeRAID 6M U320 256MB Adapter	02R0988
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	40K1051
IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	40K1052
XpandOnDemand™ Scalability Cable - 2.3M	13M7414
XpandOnDemand™ Scalability Cable - 2.9M	13M7416
x3950 Scalability Enablement Memory Adapter	41Y5004
x3950 E Modular Expansion Enclosure	8874-3RY
Dual Core X3 upgrade kit	41Y5005
Other options at ibm.com/pc/us/accessories	

Keyboard / mouse None standard (because rack-based)
Power supplies Std: Two 1300 watt hot-swap(240 VAC); 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 for ServeRAID 8i adapter



3U Rack
 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: 1,325 Btu/hr (388 watts)
 Full Configuration: 5,200 Btu/hr (1524 watts)

- ⇨ 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

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

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	Disks	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8878-1RY	2 x Xeon™ MP 7110N	2.5GHz	DC 2x1MB	2x1GB	8	Two	None	SAS	3U ⁴ rack	6x7	2 x 1300	3	Nov 2006
8878-2RY	2 x Xeon MP 7120N	3.0GHz	DC 2x1MB	2x2GB	8	Two	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2006
8878-3RY	2 x Xeon MP 7130N	3.16GHz	DC 2x1MB	2x2GB	8	Two	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2006
8878-4RY	2 x Xeon MP 7140N	3.3GHz	DC 2x1MB	2x2GB	16	Four	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2006
8878-5RY	2 x Xeon MP 7150N	3.5GHz	DC 2x1MB	2x2GB	16	Four	None	SAS	3U rack	6x7	2 x 1300	3	Feb 2007

Processors Two 64-bit Intel® Xeon™ Processor MP up to 3.5GHz¹ 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading technology
L2 cache 1MB / per core / Xcel4v™ Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache 4MB on 7110N & 7120N / 8MB on 7130N / 16MB on 7140N
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, four memory board slots, 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™)

SAS disk controller ALL: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / **ServeRAID™ 8i / RAID 0, 1, 10, 5, 6, 60, 1E & 5EE** / standard on 2RY, 3RY & 4RY / dedicated slot / 64-bit 133MHz PCI-X / optional on others
SAS connectors Dual channel controller wired to SAS backplane
SAS cabling Two standard SAS cables 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 (3U)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER) / connect eight chassis (x3950 or x3950 E) 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 support up to 266MHz

DVD-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
System 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 / BMC / IMPI 2.0 / **PowerExecutive™**

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

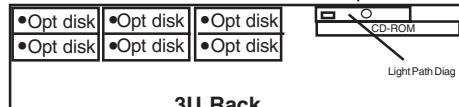
Keyboard / mouse None standard (because rack-based)
Power supplies Std: Two 1300 watt hot-swap(240 VAC); Max: two hot-swap / fully redundant with two power supplies / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA

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	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809
16W = 6 x XpandOnDemand Scalability kits 2.3m	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812
32W = 8 x XpandOnDemand Scalability kits 2.3m + 4 x2.9m	8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Six available 3.3 volt PCI-X 2.0 slots:	Active Memory 4-slot Expansion Card	41Y5000
Slot 1 - fullsize, 64-bit, 266MHzPCI-X, hot-swap	Xeon 7110N 2.5GHz/4MB L3/Dual Core Proc	40K1259
Slot 2 - fullsize, 64-bit, 266MHzPCI-X, hot-swap	Xeon 7120N 3.0GHz/4MB L3/Dual Core Proc	40K1260
Slot 3 - fullsize, 64-bit, 266MHzPCI-X, hot-swap	Xeon 7130N 3.16GHz/8MB L3/Dual Core Proc	40K1261
Slot 4 - fullsize, 64-bit, 266MHzPCI-X, hot-swap	Xeon 7140N 3.3GHz/16MB L3/Dual Core Proc	40K1262
Slot 5 - fullsize, 64-bit, 266MHzPCI-X, hot-swap	Xeon 7150N 3.5GHz/16MB L3/Dual Core Proc	43V4553
Slot 6 - fullsize, 64-bit, 266MHzPCI-X, hot-swap	IBM ServeRAID™-8i Adapter	39R8729
*exclusive slot for ServeRAID 8i adapter	IBM ServeRAID 6M U320 256MB Adapter	39R8816
	IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	40K1051
	IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	40K1052
	XpandOnDemand™ Scalability Cable - 2.3M	13M7414
	XpandOnDemand™ Scalability Cable - 2.9M	13M7416
	x3950 Scalability Enablement Memory Adapter	41Y5004
	x3950 E Modular Expansion Enclosure	8874-3RY
	Dual Core X3 upgrade kit	41Y5005
	Other options at ibm.com/pc/us/accessories	

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 for ServeRAID 8i adapter



3U Rack

Bay ① 2.5", 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: 1,325 Btu/hr (388 watts)
 Full Configuration: 5,200 Btu/hr (1524 watts)

- ⊘ 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

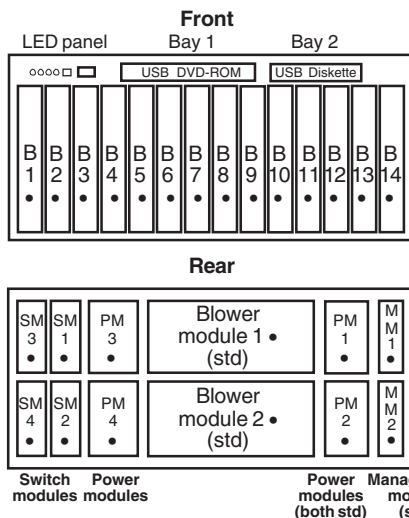
All models: Maximum internal disk capacity: 440.4GB with six 73.4GB² hot-swap SAS disks

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, 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

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
8677-3RX	HC10/HS20/HS21/HS40/JS20/JS21/LS20/LS21**/LS41**	0 / 14	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2000W	2 / 2	7U ⁴ 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 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 (8677-3RX only)	Std: one on 3RX; 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 (8677-3XX only)	Std: one on 3XX; 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 / up to 325 cubic ft per min (CFM) / front to back airflow									
Mechanical DVD / diskette / USB	EIA 19" rack models (7U⁴) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 ER, NetBAY42 SR) 3XX/3RX: 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 GB Ethernet Switch Module (the second ethernet controller requires a second optional 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	



- 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

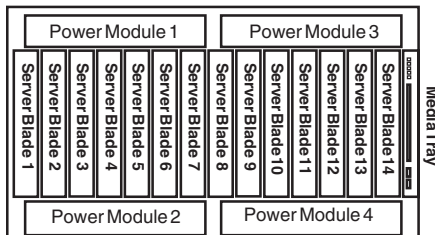
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 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/HS21/JS20/JS21/LS20/LS21/LS41	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 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 blowers / 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									

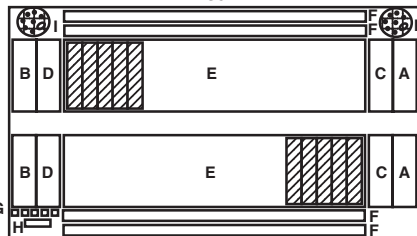
1U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17231UX	BladeCenter H 2900W Power Module pair with Fan Packs	31R3335
2U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17232UX	IBM Advanced Management Module	25R5778
NetBAY ACT Local Console Manager (CAT5 KVM cabling)	1735L04	BladeCenter 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 IEC320-C20 (ANZ)	25R5812
Cisco Systems Gigabit Ethernet Switch Module	32R1892	BladeCenter H Serial Port Breakout Cable	40K9605
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 BladeCenter® T 8720 (DC power)

xREF by STG 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
8720-1RX	HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41**	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	HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41**	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 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 Vectedored 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)	32R0833
McData EFCM Element Manager for 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

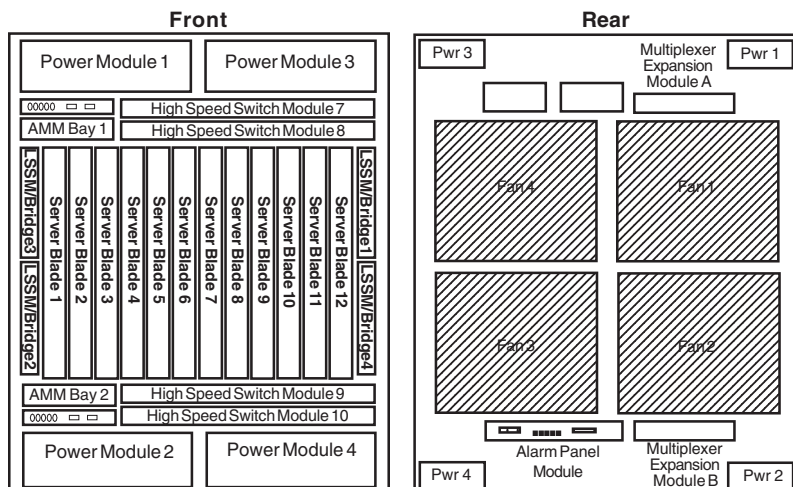
- ◊ Dimensions: H13.76"(8U) x W17.4" x D20"(front bezel to rear I/O); H349.5mm x W441.9mm x D508mm
- ◊ Weight: 98 to 192 lb; 44.5 to 87.38kg
- ◊ Stealth black color bezel
- ◊ Tool-free customer serviceability
- ◊ Access server blades, power supplies, mgmt modules, media tray and expansion units from 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

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	Fan modules std / max	Mechanical	Available date
8750-1RX	HS20/HS21/JS20/JS21/LS20/LS21/LS41/AMC/NGW	0 / 12	0 / 8	Enet, 10Gb Enet, Fibre Ch, IB, 4X IB, OPM and CPM	1 / 2	2 / 4	2535W (DC -48V)	4 / 4	12U ⁴ rack	Jun 2007
Positioning Description	Leadership High Speed, High Performance, carrier grade blade platform for Next Generation Network applications									
Blade bays	Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external storage switching and connectivity, and I/O (USB and video) Supports all blades and Blade Expansion Units / 12 hot-swappable bays / front access									
High Speed Switch Modules	Std: none; max: four/ hot-swap / front access / 10Gb Ethernet / 4X InfiniBand / Copper 4X Pass-thru									
Legacy SwitchModules	Std: none; max: four/ hot-swap / front access / Gb Eth / 10Gb Eth uplink / 4Gb Fibre Channel / 4X InfiniBand uplink / Optical Pass-thru / Copper Pass-thru /									
Advanced Management Modules	Std: one; max: two / hot-swap / front 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 / input voltage range -48VDC to -60VDC (Min/Max) / redundant within pair (N+N redundancy) / power modules 1 and 2 support blade bays 1- 6, all legacy switch and bridge modules, upper and lower media trays, both advanced management modules, multiplexer expansion modules and alarm panel module / power modules 3 and 4 support blade bays 7-12 and all High Speed Switch Modules / worldwide / auto-restart / 3 fans per power module									
Fan Modules	Std/max: four / hot-swap / redundant / speed controlled according to ambient air temperature / rear access / front to back airflow									
Mechanical	EIA 19" rack models (12U⁴) x 706mm deep / supported in NetBAY™ Racks with seismic bracing									
Media Tray	Std: one; max: two / two USB 2.0 ports / two internal compact flash slots / Full Light Path Diagnostic panel / customer serviceable / hot swap / front access / shared by all blade servers / requests for USB ports by pressing media 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									
Ports	Rear: DB-15 telco alarm panel interface and one DB-50 blade serial aggregate for break out cable (both on alarm panel module); Front: two or four USB 2.0 (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, fans, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager									
System LED panel	System LED panel provides power-on, location, Critical, Major and Minor telecom alarm indicators, front and rear of chassis									



- Dimensions: H21" x W17.4" x D27.8"
- Dimensions: H528mm x W441.9mm x D706mm
- Weight: 150 to 350 lb; 62.8 to 159kg
- Power input type: 4x 4-post terminal, -48VDC to -60VDC, 60A per input
- Stealth black color bezel
- Tool-free customer serviceability
- Access Mgmt modules, blade servers, expansion units, I/O modules and power modules from front
- Midplane in rear of system to interface for all system components
- Predictive Failure Analysis® alerts on fans, blade server memory, processor(s), and optional disk(s) with IBM Director
- NEBS Level 3 (Class A) / ETSI Compliant

LIMITED WARRANTY³

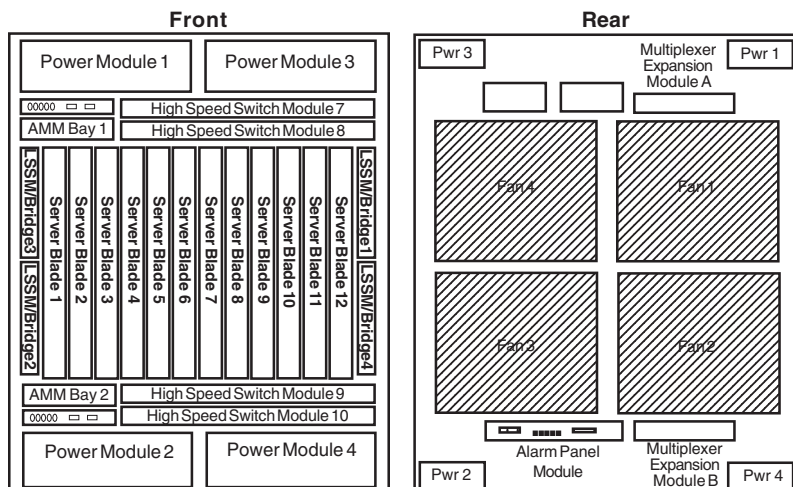
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 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 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

BladeCenterHTDCPowerSupplyModule	42C5279
BladeCenter HT 2-Post Rack mount Kit	42C5281
BladeCenter HT 4-Post Rack mount Kit (for IBM 7014/9308)	42C5284
BladeCenter HT SW/Bridge Interposer Tray	42C5300
BladeCenter HT HSS Interposer w/Thumb Screws	42C5302
BladeCenter HT Advanced Management Module Interposer	42C5315
IBM BladeCenter Advanced Management Module	25R5778
BladeCenter HT RedundantMedia Tray	42C5305
BladeCenter HT Filter (4 pack)	42C5316
BladeCenter HT Bezel w/Air Filter & Cable Mgmt Collar	42C5278
BladeCenter HT Compact Flash 1GB Option	42C5307
BladeCenter HT Compact Flash 4GB Option	42C5310
Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888
Cisco Systems Gigabit Ethernet Switch Module	32R1892
Qlogic 20 Port 4Gb SAN Switch Module	26R0881
Brocade 20 Port 4Gb SAN Switch Module	32R1812

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

See footnotes for important warranty information

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	Fan modules std / max	Mechanical	Available date
8750-1RX	HS20/HS21/JS20/JS21/LS20/LS21/LS41/AMC/NGW	0 / 12	0 / 8	Enet, 10Gb Enet, Fibre Ch, IB, 4X IB, OPM and CPM	1 / 2	2 / 4	3160W (AC 240V)	4 / 4	12U ⁴ rack	Jun 2007
Positioning Description	Leadership High Speed, High Performance, carrier grade blade platform for Next Generation Network applications Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external storage switching and connectivity, and I/O (USB and video)									
Blade bays	Supports all blades and Blade Expansion Units / 12 hot-swappable bays / front access									
High Speed Switch Modules	Std: none; max: four/ hot-swap / front access / 10Gb Ethernet / 4X InfiniBand / Copper 4X Pass-thru									
Legacy SwitchModules	Std: none; max: four/ hot-swap / front access / Gb Eth / 10Gb Eth uplink / 4Gb Fibre Channel / 4X InfiniBand uplink / Optical Pass-thru / Copper Pass-thru /									
Advanced Management Modules	Std: one; max: two / hot-swap / front 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: five / hot-swap / front access / input voltage range -48VDC to -60VDC (Min/Max) at 50/60Hz / redundant within pair (N+N redundancy) / power modules 1 and 2 support blade bays 1- 6, all legacy switch and bridge modules, upper and lower media trays, both advanced management modules, multiplexer expansion modules and alarm panel module / power modules 3 and 4 support blade bays 7-12 and all High Speed Switch Modules / worldwide / voltage-sensing / auto-restart / 3 fans per power module									
Fan Modules	Std/max: four / hot-swap / redundant / speed controlled according to ambient air temperature / rear access / front to back airflow									
Mechanical	EIA 19" rack models (12U⁴) x 706mm deep / supported in NetBAY™ Racks with seismic bracing									
Media Tray	Std: one; max: two / two USB 2.0 ports / two internal compact flash slots / Full Light Path Diagnostic panel / customer serviceable / hot swap / front access / shared by all blade servers / requests for USB ports by pressing media 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									
Ports	Rear: DB-15 telco alarm panel interface and one DB-50 blade serial aggregate for break out cable (both on alarm panel module); Front: two or four USB 2.0 (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, fans, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager									
System LED panel	System LED panel provides power-on, location, Critical, Major and Minor telecom alarm indicators, front and rear of chassis									



- Dimensions: H21" x W17.4" x D27.8"
- Dimensions: H528mm x W441.9mm x D706mm
- Weight: 150 to 350 lb; 62.8 to 159kg
- Power input type: 4x C20, 200-240VAC, 16A per input
- Stealth black color bezel
- Tool-free customer serviceability
- Access Mgmt modules, blade servers, expansion units, I/O modules and power modules from front
- Midplane in rear of system to interface for all system components
- Predictive Failure Analysis® alerts on fans, blade server memory, processor(s), and optional disk(s) with IBM Director
- NEBS Level 3 (Class A) / ETSI Compliant

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 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

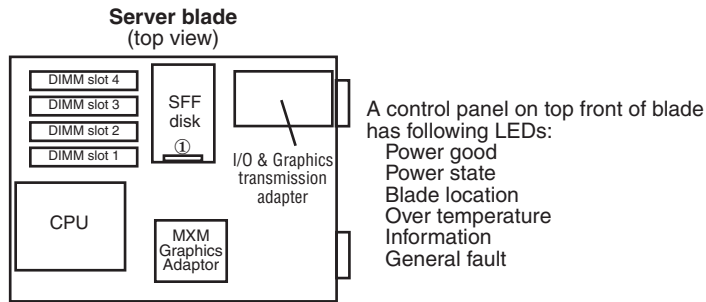
BladeCenter HT AC Power Supply Module	42C5280
BladeCenter HT 2-Post Rack mount Kit	42C5281
BladeCenter HT 4-Post Rack mount Kit (for IBM 7014/9308)	42C5284
BladeCenter HT SW/Bridge Interposer Tray	42C5300
BladeCenter HT HSS Interposer w/Thumb Screws	42C5302
BladeCenter HT Advanced Management Module Interposer	42C5315
IBM BladeCenter Advanced Management Module	25R5778
BladeCenter HT Redundant Media Tray	42C5305
BladeCenter HT Filter (4 pack)	42C5316
BladeCenter HT Bezel w/Air Filter & Cable Mgmt Collar	42C5278
BladeCenter HT Compact Flash 1GB Option	42C5307
BladeCenter HT Compact Flash 4GB Option	42C5310
Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888
Cisco Systems Gigabit Ethernet Switch Module	32R1892
Qlogic 20 Port 4Gb SAN Switch Module	26R0881
Brocade 20 Port 4Gb SAN Switch Module	32R1812

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

See footnotes for important warranty information

IBM® Type-model	Processor	GHz¹	L2 Core cache	Watts	Memory	Disk	OS	Graphics adapter	Mechanical	Ethernet	Available date
7996-21x 1 x Core™2 Duo E6300	1.86 DC 2MB 65W	1GB 60GB SATA	Vista 64-bit	Quadro® NVS 120M	single slot blade	1 x Gb	Sep 2007				
7996-51x 1 x Core 2 Duo E6700	2.66 DC 4MB 65W	2GB 60GB SATA	Vista 64-bit	Quadro NVs 120M	single slot blade	1 x Gb	Sep 2007				
7996-5Ax 1 x Core 2 Duo E6700	2.66 DC 4MB 65W	2GB 60GB SATA	Vista 64-bit	Quadro FX 1600M	single slot blade	1 x Gb	Sep 2007				
7996-5Bx 1 x Core 2 Duo E6700	2.66 DC 4MB 65W	4GB 60GB SATA	Vista 64-bit	Quadro FX 1600M	single slot blade	1 x Gb	Sep 2007				

Positioning Processor(s)	Flagship Server-Based Computing for workstation customers providing security, lower TCO, manageability, flexibility and availability Intel® Core 2 Duo up to 1.86GHz / 2MB L2 ECC Cache / Core 2 Duo up to 2.66GHz / 4MB L2 ECC Cache / All 1066MHz FSB / All Dual-Core / All optimized for Extended Memory 64 Technology (EM64T)
SMP L2 Cache Implementation	Single Processor, no upgrade 2 or 4MB std and max / at processor speed Systemboard contains one Intel LGA775 socket, four DIMM slots, support for either Intel integrated graphics or one MXM3 form factor graphics connector, one I/O and Graphics transmission adapter connector, one on-board Gigabit ethernet NIC and one Gigabit ethernet connection for remote video
Memory	1, 2 or 4GB std / 8GB ¹³ max / two slots used / two slots available / on base blade / PC2-5300 667MHz un-buffered DDR2-SDRAM DIMMs / non-ECC / DIMMs must be installed in matched pairs [a bank] / dual-channel /
Graphics Controller	Professional 2D: Nvidia® Quadro NVS 120M / 128MB / PCI-Express 16x / UXGA Advanced 3D: Nvidia Quadro FX 1600M / 256MB / PCI-Express 16x / UXGA
SATA disk controller	SATA controller / integrated in ICH8 / 300MB/sec / support for one 2.5" SATA disks
SATA disk bay	One 2.5-inch Small Form Factor (SFF) SATA internal fixed disk bays
External Storage	Support for IBM TotalStorage solutions
Mechanical Architecture/Chipset	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 Intel Q965 Express chipset / Graphics Memory Controller Hub provides: integrated graphics and PCI-Express 16x link to MXM3 video adapter / Integrated Controller Hub 8 (ICH8) provides: SATA, USB 2.0, PCI-Express 1x link to I/O and Graphics transmission adapter, PCI-Express x1 link to Broadcom® 5708S, LPC bus to PC87427 for Super I/O
Ethernet	Gigabit Ethernet controller / Broadcom 5708S / full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full-duplex / TCP/IP Offload Engine (TOE) / Wake on LAN / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / controller connects to integrated Broadcom 5389 switch chip / BCM 5389 provides Ethernet and Video Compression interface to I/O Switch Modules
DVD / diskette	Optional via USB at Remote Desktop Appliance / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel
Keyboard / mouse	Provided by Remote Desktop Appliance / USB only
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot
Software ship group	Documentation CD, Broadcom CD, ServerGuide CD
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply(s)	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852)



1GB (2x512) PC2-5300 CL5 DDR2 667MHz Kit	41Y2822
2GB (2x1GB) PC2-5300 CL5 DDR2 667MHz Kit	41Y2825
4GB (2x2GB) PC2-5300 CL5 DDR2 667MHz Kit	41Y2828

Other options at ibm.com/products/us

Bay ① 2.5", 9.5mm, no front access, 2.5-inch SFF SAS 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
- ❖ 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 HC10 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, power and power state indication
- ❖ Preinstalled¹⁷ OS: Windows® Vista Business Blade PC Edition
- ❖ Supported¹⁷ OS: Windows XP Professional 64-bit Edition

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 44T6086)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 44T6087)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 44T6088)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 44T6089)
- ❖ 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 BladeCenter® T 8730 (AC power)

xREF by STG 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	HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41**	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	HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41**	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 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 Vectedored 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		

• 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	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)	32R0833
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® 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-L1y-L1x	1 x Xeon™2.8	1.5MB	800	512MB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Feb 2005	
8843-J1y-J1x	1 x Xeon 2.8	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Feb 2005	
8843-M5y-M5x	1 x Xeon 3.0	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Feb 2005	
8843-25y-25x	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 2005	
8843-E2y-E2x	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	
8843-35y-35x	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 2005	
8843-45y-45x	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 2005	
8843-25y-25x	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 2005	
8843-05y-05x	1 x Xeon 2.8	2MB	800	1GB	36GB	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2005	
8843-55y-55x	1 x Xeon 3.8	2MB	800	1GB	None	Ultra320 2-fixed	2 Hot-swap Ultra320	0 x 2 7U blade	2 x Gigabit	Sep 2005	
8843-E7y-E7x	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-E9y-E9x	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 / LIU, 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) / 1 or 2MB std and 4MB max / at processor speed	
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-conductor slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Chipkill™	
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) / Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)	
External Storage		
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 / 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 25R8878 Xeon 3.0GHz/800/2MB L2 Cache EM64T Proc Upg 25R8876 Xeon 3.2GHz/800/2MB L2 Cache EM64T Proc Upg 25R8877 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 39M5812 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 BladeCenter SCSI Storage Exp Unit 26K4817 BladeCenter SFF Fibre Channel Exp Card 26K4841 BladeCenter SFF Gigabit Ethernet Exp Card 26K4842
Software ship group	Documentation CD, Broadcom 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)

- SCASI expansion connector
- opt CPU
- std CPU
- DIMM slot 1
- DIMM slot 2
- DIMM slot 3
- DIMM slot 4
- I/O expansion option connector

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 300GB for total of 746GB)

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	Processor	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	SCSI Support with optional stor exp unit	slots x bays	Mechanical	Ethernet	Available date
8843-0Ry-0Rx	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
8843-2Ry-2Rx	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
8843-3Ry-3Rx	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
8843-4Ry-4Rx	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
8843-5Ry-5Rx	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

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) / 2MB std and max / at processor speed	
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 / Chipkill™	
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) / <i>Internal channel:</i> 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 of 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 <i>Optical Passthrough Module</i> (the second controller requires a second optional switch or OPM)	
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) / 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 / 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 Xeon 3.0GHz/800/2MB L2 Cache EM64T Proc Upg Xeon 3.2GHz/800/2MB L2 Cache EM64T Proc Upg Xeon 3.4GHz/800/2MB L2 Cache EM64T Proc Upg Xeon 3.6GHz/800/2MB L2 Cache EM64T Proc Upg Xeon 3.8GHz/800/2MB L2 Cache EM64T Proc Upg
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	13N0660 13N0696 13N0697
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	73P3523 39M5818 39M5809 39M5812 30R5145
Software ship group	Documentation CD, Broadcom CD	IBM 36.4GB 10K Ultra320 SCSI 2.5" SFF NHS HDD IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel	BladeCenter SCSI Storage Exp Unit BladeCenter SFF Fibre Channel Exp Card BladeCenter SFF Gigabit Ethernet Exp Card
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	26K4817 26K4841 26K4842

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

Server blade (side view)

- SCSi expansion connector
- opt CPU
- std CPU
- DIMM slot 1
- DIMM slot 2
- DIMM slot 3
- DIMM slot 4
- I/O expansion option connector

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 300GB for total of 746GB)

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 BladeCenter® HS20 (7981)

xREF by STG Field Skills and Education Team

IBM® Type-model	Processor	GHz ¹	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	SCSI Support w/ opt. storage exp unit	slots x bays	Mechanical	Ethernet	Available date
7981-2Fy	1 x Xeon™	1.67	2MB	667	1GB	Open	SAS	2-fixed	Not Supported	1 x 2	single blade	2 x Gigabit	Mar 2006
7981-3Fy	1 x Xeon	2.0	2MB	667	1GB	Open	SAS	2-fixed	Not Supported	1 x 2	single blade	2 x Gigabit	Mar 2006

Processor(s)	1 or 2 x Dual-Core Intel® Xeon LV up to 2.0 GHz with 667 MHz frontside bus (FSB) / 2MB L2 ECC Shared Advanced Transfer Cache Architecture / Features Ultra Low Voltage Processor (31 watt) with Enhanced Intel SpeedStep® Technology for reduced power consumption and heat output allowing greater rack population												
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon LV Processors (same speed/cache size) / 2MB cache std and max / at processor speed Systemboard contains two Intel 478-pin micro-FCPGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet												
Memory	1GB std / 16GB¹³ max / two slots used / two slots available / PC2-3200 400MHz CL2.5 ECC DDR2-SDRAM RDIMMs / four 240 pin gold-connector slots on systemboard / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / dual-channel / Chipkill / hot-spare Memory and Memory Mirroring support												
Disk controller	LSI Logic® 1064 SAS controller on planar (3.0Gb/sec) / Dual Internal channels / supports RAID-0 & 1 mirroring												
Disk bays	Two 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / 0GB Std / 146.8GB max												
External Storage	Support for IBM TotalStorage™ solutions (including DS and NAS family of products)												
Mechanical Architecture/Chipset	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730, and 8852 Intel E7520 chipset / MCH (Memory Controller Hub) for high-speed memory and PCI-Express / PXH-V BUS supports PCI-E to PCI-X Bridge, dual GB Ethernet and 1 PCI-X bus segment for daughter card / ICH-S supports USB (1.0), on-blade service processor, PCI-X Bus Interface to LSI1064 and ATI Radeon 7000M / Dual Broadcom 5704S												
BUS slots	No external 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 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 / 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												
DVD / Diskette / USB Kybd / video / mouse	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing select button on front control panel												
Graphics controller	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										Dual-Core Intel Xeon Processor LV 1.67 GHz Proc Upg 25F8887		25F8888
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)										Dual-Core Intel Xeon Processor LV 2.0 GHz Proc Upg 25R8888		39M5818
											1GB (2x512MB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM 39M5809		39M5812
											2GB (2x1GB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM 39M5812		30R5145
											4GB (2x2GB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM 26K5776		26K5777
											8GB (2x4GB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM 39R8624		26K4842
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode										BladeCenter SFF Fibre Channel Exp Card 39R8624		IBM BladeCenter SFF Gigabit Ethernet Expansion Card 26K4842
Software ship group	Documentation CD, Broadcom CD										Other options at ibm.com/pc/us/accessories		
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel												
Power supply(s)	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)												
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852) operating system												

Server blade (side view)

opt CPU

std CPU

DIMM slot 4

DIMM slot 3

DIMM slot 2

DIMM slot 1

expansion option connector

Light Path Diagnostics buttons

Bay ★ 2.5", 6.35cm, no front access

Bay ♀ 2.5", 6.35cm, no front access

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 LV blade server¹³:

146GB with two 73GB SAS disks

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

(HS20F) © IBM Corp. May 2006

IBM® Type-model	Processor	GHz	L2 Core	FSB cache	MHz	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
8853-L1x 1	x Xeon™ 5110	1.6	DC	4MB	1066	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Aug 2006
8853-L2x 1	x Xeon 5120	1.86	DC	4MB	1066	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Aug 2006
8853-L3x 1	x Xeon 5130	2.0	DC	4MB	1333	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Aug 2006
8853-L4x 1	x Xeon 5140	2.33	DC	4MB	1333	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Aug 2006
8853-L5x 1	x Xeon 5150	2.66	DC	4MB	1333	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Aug 2006
8853-L6x 1	x Xeon 5160	3.0	DC	4MB	1333	80W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Aug 2006
8853-A1x 1	x Xeon E5310	1.6	QC	8MB	1066	80W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Jan 2007
8853-C1x 1	x Xeon E5320	1.86	QC	8MB	1066	80W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Jan 2007
8853-NTx 1	x Xeon 5138 LV	2.13	DC	4MB	1333	35W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Jan 2007
8853-H1x 1	x Xeon 5148 LV	2.33	DC	4MB	1333	40W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Jan 2007
8853-A2x 1	x Xeon E5335	2.0	QC	8MB	1333	80W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Feb 2007
8853-C2x 1	x Xeon E5345	2.33	QC	8MB	1333	80W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Feb 2007

Processor(s)	1 x Intel® Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 3.0GHz with 1333MHz FSB / 4MB L2 ECC Cache / Dual-Core / 1 x Intel Xeon up to 2.33GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T / NTx and H1x feature Low Voltage processors for reduced heat and power consumption, allowing even greater performance per watt													
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 4 or 8MB std and max / at processor speed Systemboard contains two Intel LGA771 sockets, four DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet													
Memory	1 or 2GB std / 16GB ¹³ max / two slots used / two slots available / on base blade / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / memory sparing / Additional memory DIMMs can be added to each base HS21 with the Memory and I/O Expansion Unit, allowing up to 32GB of memory per blade													
SAS disk controller	LSI Logic® 1064E SAS controller / two port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 & 1 mirroring / two 29-pin SFF SAS cables													
SAS Disk bays	Two 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit													
External Storage	Support for IBM TotalStorage™ solutions													
Mechanical Architecture/Chipset	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 (L6x only supported in 8852) Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O													
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® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over 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 legacy connector or PCI-Express connector for I/O expansion options / 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)													
DVD / diskette / USB Kybd / video / mouse Graphics controller	None / requests for DVD-ROM, diskette 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® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus													
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module													
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, Broadcom CD, ServerGuide CD													
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel													
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system													

Server blade (side view)

- memory expansion connector
- opt SFF disk
- opt SFF disk
- daughter card connector
- DIMM slot 1
- DIMM slot 2
- DIMM slot 3
- DIMM slot 4
- blade expansion connector

- 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 HS21 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

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

Maximum internal disk capacity for each HS21 blade server¹³:
292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

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	Processor	GHz	L2 Core cache	FSB MHz	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
8853-J1x 1 x Xeon™ L5310	1.6	QC 8MB	1066	50W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Apr 2007	
8853-J2x 1 x Xeon L5320	1.86	QC 8MB	1066	50W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Apr 2007	
8853-C3x 1 x Xeon X5355	2.66	QC 8MB	1333	120W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Apr 2007	

Processor(s)	1 x Intel® Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 2.66GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T / J1x and J2x feature Low Voltage processors for reduced heat and power consumption, allowing even greater performance per watt												
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 8MB std and max / at processor speed Systemboard contains two Intel LGA771 sockets, four DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet												
Memory	2GB std / 16GB¹³ max / two slots used / two slots available / on base blade / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / memory sparing / Additional memory DIMMs can be added to each base HS21 with the Memory and I/O Expansion Unit, allowing up to 32GB of memory per blade												
SAS disk controller	LSI Logic® 1064E SAS controller / two port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 & 1 mirroring / two 29-pin SFF SAS cables												
SAS Disk bays	Two 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit												
External Storage	Support for IBM TotalStorage™ solutions												
Mechanical Architecture/Chipset	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 (C3x only supported in 8852) Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O												
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® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over 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 legacy connector or PCI-Express connector for I/O expansion options / 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)												
DVD / diskette / USB	None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media 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 controller	SVGA / ATI® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus												
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module												
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, Broadcom CD, ServerGuide CD												
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852**) / thermal sensors on each processor and BladeCenter modules and front panel												
Power supply(s)	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852**) /												
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852**), operating system												

Xeon L5310 1.6GHz/1066/8MB L2 Cache EM64T Proc Upg	43W1145
Xeon L5320 1.86GHz/1066/8MB L2 Cache EM64T Proc Upg	43W6084
Xeon X5355 2.0GHz/1333/8MB L2 Cache EM64T Proc Upg	43W6088
1GB (2x512) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5782
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5785
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5791
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5797
BladeCenter Storage and I/O Expansion Blade	39R7563
BladeCenter Memory and I/O Expansion Blade	42C1600
BladeCenter SFF Fibre Channel Expansion Card	26K4841
QLogic iSCSI Expansion Card for BladeCenter	32R1923
Other options at ibm.com/products/us	

Server blade (side view)

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 HS21 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

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

Maximum internal disk capacity for each HS21 blade server¹³:
292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

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	Processor	GHz¹	L2 Core cache	FSB MHz	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7995-L1x 1 x Xeon™ 5110		1.6	DC 4MB	1066	65W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-L2x 1 x Xeon 5120		1.86	DC 4MB	1066	65W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-L3x 1 x Xeon 5130		2.0	DC 4MB	1333	65W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-L4x 1 x Xeon 5140		2.33	DC 4MB	1333	65W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-L5x 1 x Xeon 5150		2.66	DC 4MB	1333	65W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-L6x 1 x Xeon 5160		3.0	DC 4MB	1333	80W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-A1x 1 x Xeon E5310		1.6	QC 8MB	1066	80W	2GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-A2x 1 x Xeon E5335		2.0	QC 8MB	1333	80W	2GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-C1x 1 x Xeon E5320		1.86	QC 8MB	1066	80W	2GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-C2x 1 x Xeon E5345		2.33	QC 8MB	1333	80W	2GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-NTx 1 x Xeon 5138 LV		2.13	DC 4MB	1333	35W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-H1x 1 x Xeon 5148 LV		2.33	DC 4MB	1333	40W	1GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-E2x 2 x Xeon E5345		2.33	QC 8MB	1333	80W	4GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007
7995-E5x 2 x Xeon 5150		2.66	DC 4MB	1333	65W	4GB	SAS	1-fixed	SIO	up to 2	single slot blade	2 x Gb	Feb 2007

Processor(s)	1 x Intel® Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 3.0GHz with 1333MHz FSB / 4MB L2 ECC Cache / Dual-Core / 1 x Intel Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 2.33GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T / NTx and H1x feature Low Voltage processors for reduced heat and power consumption												
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 4 or 8MB L2 std and max / at processor speed Systemboard contains two Intel LGA771 sockets, eight DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet												
Memory	1 or 2GB std / 32GB ¹³ max / two slots used / six slots available / on base blade / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two bit faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / memory sparing												
SAS disk controller	LSI Logic® 1064E SAS controller / two port / 300MB/sec / on planar / 64-bit PCI-Express / one 29-pin SFF SAS cable												
SAS Disk bays	One 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit / supports RAID 0, 1 and 5												
Flash Storage	Dedicated USB-based slot on system planar for optional USB 2.0 flash memory card (IBM 4GB Modular Flash Drive)												
External Storage	Support for IBM TotalStorage™ solutions												
Mechanical Architecture/Chipset	Single slot blade / Supported in IBM BladeCenter 8677 and 8852 (L6x, A1x, A2x, C1x, C2x & E2x only supported in 8852) Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O												
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)												
Ethernet	Dual gigabit ethernet controller / Broadcom® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over 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 legacy connector or PCI-Express connector for I/O expansion options / 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)												
DVD / diskette / USB	None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media 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 controller	SVGA / ATI® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus												
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module										Xeon5110 1.6GHz/1066/4MBL2CacheEM64TProcUpg	42C0562	
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)										Xeon5120 1.86GHz/1066/4MBL2CacheEM64TProcUpg	40C0563	
											Xeon5130 2.0GHz/1333/4MBL2CacheEM64TProcUpg	40C0564	
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode										Xeon5140 2.33GHz/1333/4MBL2CacheEM64TProcUpg	40C0565	
											Xeon5150 2.66GHz/1333/4MBL2CacheEM64TProcUpg	40C0566	
Software ship group	Documentation CD, Broadcom CD, ServerGuide CD Uses cooling from BladeCenter chassis / thermal sensors on each processor and BladeCenter modules and front panel										Xeon5160 3.0GHz/1333/4MBL2CacheEM64TProcUpg	40C0567	
											Xeon E5310 1.6GHz/1066/8MBL2CacheEM64TProcUpg	43X1002	
Cooling Fans	Uses power module(s) in BladeCenter chassis Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										Xeon E5320 1.86GHz/1066/8MBL2CacheEM64TProcUpg	42C0572	
											Xeon5138 2.13GHz/1333/4MBL2CacheEM64TProcUpg	40C0568	
Power supply(s)	Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										Xeon5148 2.33GHz/1333/4MBL2CacheEM64TProcUpg	40C0569	
											Xeon E5335 2.0GHz/1333/8MBL2CacheEM64TProcUpg	43X1003	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										Xeon E5345 2.33GHz/1333/8MBL2CacheEM64TProcUpg	42C0570	
											1GB (2x512) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5782	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										2GB (2x1GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5785	
											4GB (2x2GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5791	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										8GB (2x4GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5797	
											BladeCenter Storage and I/O Expansion Blade	39R7563	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										BladeCenter SFF Fibre Channel Expansion Card	26K4841	
											QLogic iSCSI Expansion Card for BladeCenter	32R1923	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										IBM 4GB Modular Flash Device	39R8697	
											Other options at ibm.com/products/us/		

Server blade (side view)

opt CPU

std CPU

DIMM slot 8

DIMM slot 7

DIMM slot 6

DIMM slot 5

DIMM slot 4

DIMM slot 3

DIMM slot 2

DIMM slot 1

opt Flash Drive

opt SFF disk

daughtercard connector

blade expansion connector

- 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 HS21 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

Bay ① 2.5", no front access, optional 2.5-inch SFF SAS disk

Maximum internal disk capacity for each HS21 XM blade server¹³:
146GB with one SAS disk (with BladeCenter Storage Expansion Unit
3 x 146GB for total of 438GB)

LIMITED WARRANTY³

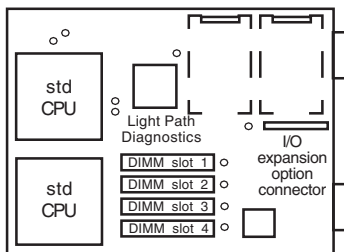
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response (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	GHz¹ Core	L2 cache	Memory	Disk	Disk bays	Optional storage expansion unit	slots x bays	Mechanical	Ethernet	NEBS	Available date
8842-RTU	2 x PowerPC 970FX	2.2	SC 512KB	2GB	N/A	None	None	0 x 0	9.5mm blade	2 x Gigabit	Yes	May 2006

Positioning Processor(s) L2 Cache SMP support Implementation	The IBM BladeCenter server for reliability in mission-critical telecommunications environments 2 x IBM PowerPC™ 970FX up to 2.2GHz Single-Core / 64 bit 512KB L2 Cache 2-way SMP / with two PowerPC Processors (same speed/cache size) Server blade contains two IBM PowerPC microprocessors soldered to planar, four DIMM slots, PCI-X, EIDE controller, Fibre Channel expansion card support and dual Gigabit ethernet											
Memory	2GB std (2x1GB) / 8GB ¹³ max / two slots used / two slots available / PC-2700 333MHz CL2.5 ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual-channel											
IDE controller Disk bays External Storage	Enhanced IDE ATA-100 controller in AMD 8111 South Bridge None (HDDs not supported in NEBS environment) Support for IBM TotalStorage™ solutions (including FASTt and NAS family of products)											
Mechanical	Single-wide Blade / NEBS Support in IBM BladeCenter T											
Architecture/Chipset	IBM U3 Northbridge / AMD 8131 HyperTransport Tunnel and PCI-X Bridge / AMD 8111 Southbridge providing USB1.1 and IDE / Broadcom 5704S / NS PC87417 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® 5704S / 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)											
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 None											
Systems Mgmt	IBM Integrated Service Processor / H82148 / 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						1GB PC-2700 ECC CL2.5 DDR RDIMM 2GB PC-2700 ECC CL2.5 DDR RDIMM IBM BladeCenter T Advanced Management Module IBM BladeCenter T Chassis (AC Version) IBM BladeCenter T Chassis (DC Version) IBM 1300W AC Power Supply (x2) IBM 1300W DC Power Supply (x2)			39M5839 39M5843 32R0835 87301RX 87201RX 32R0834 32R0833		
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						Other options at ibm.com/pc/us/accessories					
Cooling Fans	Uses cooling from BladeCenter T (types 8730 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel											
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter T (types 8730 and 8720) Monitor, keyboard, mouse for setup; ethernet switch module, FCC expansion card, BladeCenter T(types 8730 and 8720), operating system											

Server blade (side view)



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)
- ◊ RTU 2-core 250W
- ◊ 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 JS20 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

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	GHz ¹	Core	L2 Cache	Memory	Disk	Disk controller	Disk bays	Optional storage expansion unit	Mechanical	Ethernet	Available date
8844-31U	2 x PPC 970MP	2.7*	DC	1MB	2x512MB 400MHz	Open	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Mar 2006
8844-51U	2 x PPC 970MP	2.5*	DC	2x1MB	2x1GB 400MHz	Open	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Mar 2006
8844-E3U	2 x PPC 970MP	2.7*	SC	1MB	2x1GB 533MHz	1x73GB	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Aug 2006
8844-E5U	2 x PPC 970MP	2.5*	DC	2x1MB	2x2GB 533MHz	1x73GB	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Aug 2006
8844-41U	2 x PPC 970MP	2.3*	DC	2x1MB	2x1GB 533MHz	Open	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Oct 2006

Positioning	The IBM BladeCenter JS21 blade server delivers exceptional capabilities for AIX 5L™, HPC Linux Clusters, web serving, and server consolidation. With built-in virtualization, the JS21 is equally suitable for building front-end and mid-tier web farms with virtual Linux partitions, saving time and money on setup and deployment, or migrating older UNIX workloads to BladeCenter to reduce maintenance costs. The JS21 is also optimized for scientific research in life sciences and seismic analysis with its integrated vector accelerator. For the needs of SMB and HPC, the JS21 Express models (E3U, E5U) are available pre-configured with faster 533MHz memory and integrated storage for out-of-the-box functionality at a lower price.											
Processor(s) L2 Cache SMP support Implementation	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 / two PowerPC Processors (single core or dual core) Server blade contains two IBM PowerPC microprocessors soldered to planar, four DIMM slots, 17X PCI Express, SAS controller, Gigabit Ethernet, Fibre Channel, Myrinet and InfiniBand expansion card support, integrated graphics and dual Gigabit ethernet											
Memory	1, 2 or 4GB 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-conductor slots / DIMMs must be installed in matched pairs [a bank] and banks must match in speed (MHz), though not size / 2-way memory interleave / dual-channel / Chipkill with x4 DIMMs											
SAS Disk controller SAS Disk bays External Storage	One integrated / IBM SAS controller / two port / on planar / 64-bit 133MHz PCI-X / supports RAID-0 & 1 Supports max of two non-hot-swap 2.5" / small form factor (SFF) SAS drives / 3.0GB/s / E3X and E5X include one 73GB drive std Support for IBM TotalStorage™ solutions (including FASiT 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® / Serial over 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 legacy connector or PCI-Express connector for I/O expansion options / 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)											
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 PowerExecutive™ / HACMP									1GB (2x512MB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2707 2GB (2x1GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2711 4GB (2x2GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2715 8GB (2x4GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit 41Y2703 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 NLS HDD 26K5776 IBM 73GB 10K SAS 2.5" SFF NLS HDD 26K5777 QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter 26R0890 BladeCenter SFF Gigabit Ethernet Expansion Card for BladeCenter 39R8624 Cisco InfiniBand Expansion Card for BladeCenter 32R1896 Myrinet Expansion Card for BladeCenter 73P6000 Cisco 4X InfiniBand Switch Module for BladeCenter 32R1756 Cisco 4X InfiniBand Expansion Card for BladeCenter 32R1760 Other options at ibm.com/pc/us/accessories		
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 Cooling Fans	Documentation CD, IBM Director CD, Device Driver CD 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											

Server blade (side view)

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

Bay ① 3.5", 9.5mm, no front access, optional 2.5-inch SFF SAS disk
Bay ② 3.5", 9.5mm, no front access, optional 2.5-inch SFF SAS 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/E3U 2-core 288W / 51U/E5U 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 server¹³:
146GB with two 73GB SCSI disks (with BladeCenter Storage Expansion Unit 3 x 73GB for total of 219GB***)

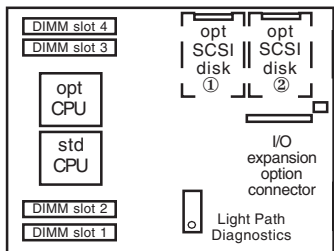
*Processor frequency is dependent upon which BladeCenter chassis the JS21 is installed:
BladeCenter (8677): 31x, 2.6GHz; 51x, 2.3GHz
BladeCenter H (8852): 31x, 2.7GHz; 51x, 2.5GHz
BladeCenter T (8720): 31x, 2.6GHz; 51x, 2.3GHz
**BladeCenter T NEBS compliance available September 2006
***BladeCenter Storage Expansion Unit support available 2nd Quarter 2007

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/lits/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
8850-56U	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 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 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 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 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								25R8892 25R8893 25R8937 25R8894 25R8895 25R8896 39M5849 39M5852 41Y2756 40K1037 40K1038 25R7748 26K4817 26K4841 26K4842 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	Qty x Processor ¹	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7971-31U	1 x Opteron 2212HE	2.0GHz/DC	2MB	68W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-3AU	1 x Opteron 2212	2.0GHz/DC	2MB	95W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-51U	1 x Opteron 2216HE	2.4GHz/DC	2MB	68W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-6AU	1 x Opteron 2218	2.6GHz/DC	2MB	95W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-E1U	2 x Opteron 2216HE	2.4GHz/DC	2MB	95W	4GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Dec 2006
7971-21U	1 x Opteron 2210HE	1.8GHz/DC	2MB	68W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Jan 2007
7971-2TU	1 x Opteron 2210HE	1.8GHz/DC	2MB	45W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Feb 2007
7971-7AU	1 x Opteron 2220	2.8GHz/DC	2MB	95W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Feb 2007
7971-61U	1 x Opteron 2218HE	2.6GHz/DC	2MB	68W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Apr 2007

Positioning Processor(s) *Ultra-dense, low power, dual socket, full performance modular computing platform with superior performance*
 Up to 2 x AMD Opteron 2000 Series Dual Core at up to 2.8GHz / simultaneously supports 32-bit and 64-bit computing
L2 Cache **1MB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O
SMP support Implementation **2-way SMP** / up to two Opteron processors (same speed/cache size)
 Systemboard contains two LGA 1207-pin sockets, eight DIMM slots, one Legacy Daughter Card connector, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet

Memory **1 or 2GB** std / 16GB max¹³ (32GB max with 4GB DIMMS*) / two slots used / six slots available
PC5300 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs / eight 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), hardware scrubbing

IDE controller/bays None
SAS disk controller None integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec / PCI-X 64-bit/133MHz / on planar / supports **RAID-1, 1E & 5** with fully populated Storage and I/O Expansion blade / no cables or external connector

SAS disk bays One non hot-swap 2.5" SFF SAS disk / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit
External storage Support for IBM TotalStorage™ solutions

Mechanical Architecture/Chipsets Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852
ServerWorks™ Chipset / HT2000 HyperTransport System I/O Controller provides: PCI-Express bridge to Legacy Daughter Card connector and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O

Bus slots No PCI or PCI-X slots (expansion via modules or network-interface option connector)

Ethernet controllers Dual gigabit 10/100/1000 Ethernet controllers / Broadcom® BCM5706S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz bus / full-duplex / TCP/IP OffloadEngine (TOE) / Wake on LAN® / Serial over LAN / Alert Standard Format 1.0 / Load balancing or teaming / Failover, adapter fault tolerance / one of the dual controllers connects to an optional, supported Ethernet switch or *Passthrough Module* (the second controller requires a second optional switch or PM)

Network-interface **One legacy connector or PCI-Express connector for I/O expansion options** / 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)

DVD / diskette / USB None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media 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™ RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt **IBM Baseboard Management Controller (BMC) / H8S2166** / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement 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, Device Driver CD, ServerGuide CD

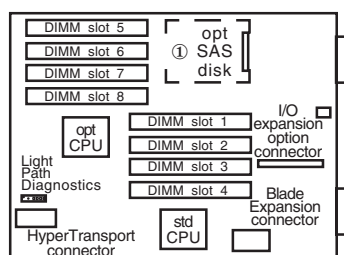
Cooling fans Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel
 Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)

Power supply Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system

Dual Core AMD Opteron Processor Model 2210 HE	40K1263
Dual Core AMD Opteron Processor Model 2212 HE	25R8898
Dual Core AMD Opteron Processor Model 2212	25R8931
Dual Core AMD Opteron Processor Model 2216 HE	25R8899
Dual Core AMD Opteron Processor Model 2218	25R8897
Dual Core AMD Opteron Processor Model 2218 HE	44E5246
Dual Core AMD Opteron Processor Model 2220	40K1264
1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5861
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5864
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5867
8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit*	39M5870
IBM 36GB NHS 2.5" SFF SAS HDD	26K5776
IBM 73GB NHS 2.5" SFF SAS HDD	26K5777
BladeCenter Storage and I/O Expansion Blade	39R7563
BladeCenter SFF Fibre Channel Expansion Card	26K4841
BladeCenter SFF Gigabit Ethernet Expansion Card	39R8624
QLogic iSCSI Expansion Card for BladeCenter	32R1923
QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter	26R0890
Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter	39Y9186

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

Server blade (side view)



Bay ① 2.5", 9.5mm, no front access, optional SFF SAS 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
 - 11 lbs; 5.0kg (max configuration)
 - Configuration/Setup Utility: F1 at startup
 - Diagnostics (PC-Doctor™): F2 at startup
 - Network Boot: F12 at startup
 - PXE Boot Agent Utility: Ctrl+S at startup
 - Blade control panel on each LS21 blade 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

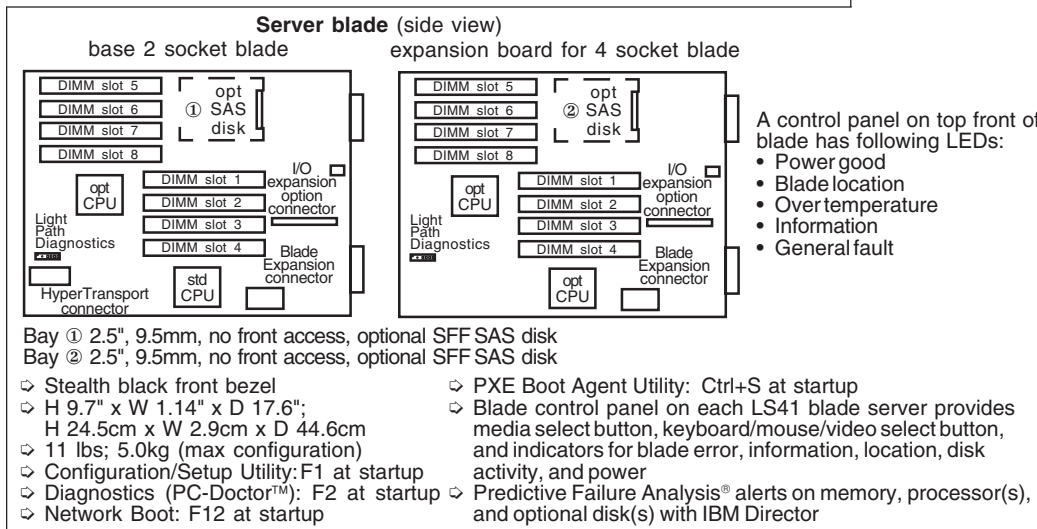
LIMITED WARRANTY³

- 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 69P9517)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P5921)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P5922)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9526)
 - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁸

See footnotes for important warranty information

*4GB DIMMS support available December 2006

IBM® Type-model	Qty x Processor ¹	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7972-31U	1 x Opteron 8212HE	2.0GHz/DC	2MB	68W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-32U	2 x Opteron 8212HE	2.0GHz/DC	2MB	68W	2GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-3AU	1 x Opteron 8212	2.0GHz/DC	2MB	95W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-3BU	2 x Opteron 8212	2.0GHz/DC	2MB	95W	2GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-51U	1 x Opteron 8216HE	2.4GHz/DC	2MB	68W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-52U	2 x Opteron 8216HE	2.4GHz/DC	2MB	68W	4GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-6AU	1 x Opteron 8218	2.6GHz/DC	2MB	95W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-6BU	2 x Opteron 8218	2.6GHz/DC	2MB	95W	4GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-E2U	4 x Opteron 8216HE	2.4GHz/DC	2MB	68W	16GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Dec 2006
Positioning Processor(s)	Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance Up to 4 x AMD Opteron 8000 Series Dual Core at up to 2.6GHz / simultaneously supports 32-bit and 64-bit computing											
L2 Cache	1MB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O											
SMP support Implementation	2 or 4-way SMP / up to four Opteron processors (same speed/cache size) Systemboard contains up to four LGA1207-pin sockets, up to sixteen DIMM slots, up to two Legacy Daughter Card connectors, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet											
Memory	1, 2 or 4GB std / 16GB max ¹³ with double socket blade / 32 GB max ¹³ with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / PC5300 667MHz registered 240-pin ECC DDR2 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), hardware scrubbing											
SAS disk controller	Up to two integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec / PCI-X 64-bit/133MHz / on planar / supports RAID 0, 1 / RAID-1, 1E & 5 with fully populated Storage and I/O Expansion blade / no cables or external connector											
SAS disk bays	Up to two non hot-swap 2.5" SFF SAS disks / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit											
External storage	Support for IBM TotalStorage™ solutions											
Mechanical Architecture/Chipsets	Single or double slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 ServerWorks™ Chipset / Up to two HT2000 HyperTransport System I/O Controllers providing: PCI-Express bridges to Legacy Daughter Card connectors and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O											
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)											
Ethernet controllers	Up to four gigabit Ethernet controllers / dual 10/100/1000 Ethernet controllers on single slot blade / Broadcom® BCM5706S / PCI-X 64-bit 133MHz bus / double socket blade adds Broadcom BCM5708S / dual10/100/1000 Ethernet controllers / PCI-Express / up to four full gigabit ethernet MAC and PHY layer functions / full-duplex / TCP/IP OffloadEngine (TOE) / iSCSI / Wake on LAN® / Serial over LAN / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Remote Direct Memory Access (RDMA)											
Network-interface	Up to two legacy connector or PCI-Express connector for I/O expansion options / 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)											
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® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus											
Systems mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module											
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, Device Driver CD, ServerGuide CD											
Cooling fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel											
Power supply Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system											
											Dual Core AMD Opteron Processor Model 8212HE	25R8934
											Dual Core AMD Opteron Processor Model 8212	25R8932
											Dual Core AMD Opteron Processor Model 8216HE	25R8935
											Dual Core AMD Opteron Processor Model 8218	25R8933
											1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5861
											2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5864
											4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5867
											8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit*	39M5870
											IBM 36GB NHS 2.5" SFF SAS HDD	26K5776
											IBM 73GB NHS 2.5" SFF SAS HDD	26K5777
											BladeCenter Storage and I/O Expansion Blade	39R7563
											BladeCenter SFF Fibre Channel Expansion Card	26K4841
											BladeCenter SFF Gigabit Ethernet Expansion Card	39R8624
											QLLogic iSCSI Expansion Card for BladeCenter	32R1923
											QLLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter	26R0890
											Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter	39Y9186
	Other options at ibm.com/pc/us/accessories											



LIMITED WARRANTY³

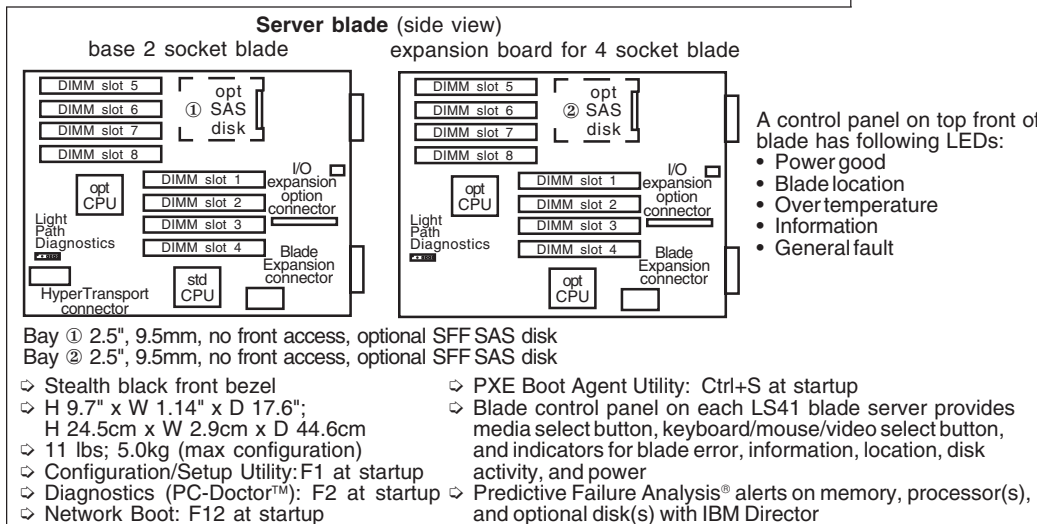
- ⇒ 3 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® partnum 12x7014)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7015)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7018)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7019)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7022)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7023)
- 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

*4GB DIMMS support available December 2006 (LS41A) © IBM Corp. December 2006

IBM® Type-model	Qty x Processor ¹	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7972-4TU	2 x Opteron 8214HE	2.2GHz/DC	2MB	68W	2GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Feb 2007
7972-7AU	1 x Opteron 8220	2.8GHz/DC	2MB	95W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Feb 2007
7972-7BU	2 x Opteron 8220	2.8GHz/DC	2MB	95W	4GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Feb 2007
7972-61x	1 x Opteron 8218HE	2.6GHz/DC	2MB	68W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Apr 2007
7972-62x	2 x Opteron 8218HE	2.6GHz/DC	2MB	68W	4GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Apr 2007

Positioning Processor(s) L2 Cache SMP support Implementation	Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance Up to 4 x AMD Opteron 8000 Series Dual Core at up to 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 or 4-way SMP / up to four Opteron processors (same speed/cache size) Systemboard contains up to four LGA1207-pin sockets, up to sixteen DIMM slots, up to two Legacy Daughter Card connectors, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet											
Memory	1, 2 or 4GB std / 16GB max ¹³ with double socket blade / 32 GB max ¹³ with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / PC5300 667MHz registered 240-pin ECC DDR2 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), hardware scrubbing											
SAS disk controller	Up to two integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec / PCI-X 64-bit/133MHz / on planar / supports RAID 0, 1 / supports RAID-1, 1E & 5 with fully populated Storage and I/O Expansion blade / no cables or external connector											
SAS disk bays	Up to two non hot-swap 2.5" SFF SAS disks / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit											
External storage	Support for IBM TotalStorage™ solutions											
Mechanical Architecture/Chipsets	Single or double slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 ServerWorks™ Chipset / Up to two HT2000 HyperTransport System I/O Controllers providing: PCI-Express bridges to Legacy Daughter Card connectors and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O											
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)											
Ethernet controllers	Up to four gigabit Ethernet controllers / dual 10/100/1000 Ethernet controllers on single slot blade / Broadcom® BCM5706S / PCI-X 64-bit 133MHz bus / double socket blade adds Broadcom BCM5708S / dual10/100/1000 Ethernet controllers / PCI-Express / up to four full gigabit ethernet MAC and PHY layer functions / full-duplex / TCP/IP OffloadEngine (TOE) / iSCSI / Wake on LAN® / Serial over LAN / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Remote Direct Memory Access (RDMA)											
Network-interface	Up to two legacy connector or PCI-Express connector for I/O expansion options / 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)											
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® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus											
Systems mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module										Dual Core AMD Opteron Processor Model 8214HE 40K1265 Dual Core AMD Opteron Processor Model 8218HE 44E5247 Dual Core AMD Opteron Processor Model 8220 40K1266 1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 39M5861 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 39M5864 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 39M5867 8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit* 39M5870 IBM 36GB NHS 2.5" SFF SAS HDD 26K5776 IBM 73GB NHS 2.5" SFF SAS HDD 26K5777 BladeCenter Storage and I/O Expansion Blade 39R7563 BladeCenter SFF Fibre Channel Expansion Card 26K4841 BladeCenter SFF Gigabit Ethernet Expansion Card 39R8624 QLLogic iSCSI Expansion Card for BladeCenter 32R1923 QLLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter 26R0890 Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter 39Y9186	
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, Device Driver CD, ServerGuide CD											
Cooling fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel											
Power supply Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system										Other options at ibm.com/po/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® partnum 12x7014)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7015)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7018)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7019)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7022)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7023)
- 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	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 *Ultra-dense, highly manageable modular computing platform with superior performance*
Processor(s) **1 x Intel® Xeon 2.5 HGz or 3.2GHz** with 533MHz frontside bus / Hyper-Threading technology / NetBurst™ architecture
L2/L3 Cache **512KB L2 Cache / 0 - 2MB L3 Cache** / on die of processor / at processor speed
SMP support **2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation 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 max¹³ / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** 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)

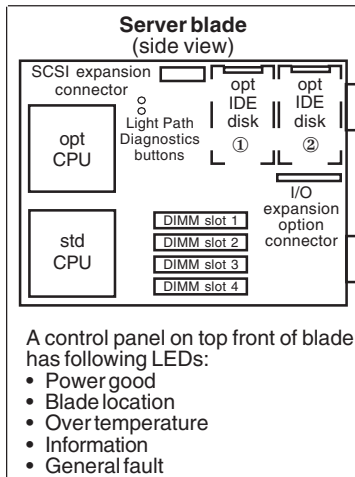
Mechanical Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products **ServerWorks® Grand Champion™ 4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / single slot one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X 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 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 *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 release²⁰
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
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 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

Xeon 3.2Ghz/512KB L2 / 1MB L3 Cache	13N0650
Proc Upg	
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



- 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

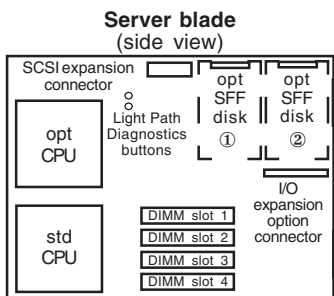
(8843) January 2005

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	3.6	GHz	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												
	BladeCenter SCSi Storage Exp Unit												
	BladeCenter SFF Fibre Channel Exp Card												
	BladeCenter SFF Gigabit Ethernet Exp Card												
	BladeCenter Optical Pass-thru Module												
	BladeCenter SCSi Storage Expansion Unit												
	17-inch Flat Panel Monitor Console Kit w/ US Kybd												
	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

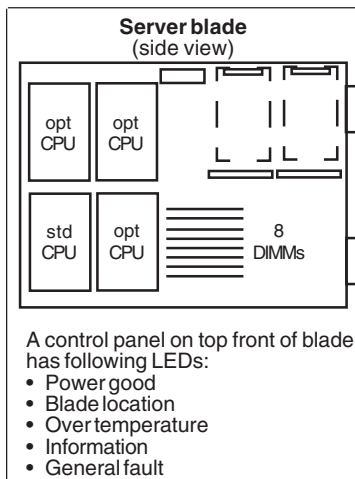
- ⇒ 3 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response (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

(HS20Tb) © IBM Corp. January 2005

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

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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