xSeries Reference (xREF)

including

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

November 15, 2005

xref@us.ibm.com

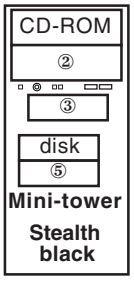
This document is available at:
http://www-1.ibm.com/servers/eserver/education/cust/xseries/xref.html

IBM® Machine Type	Model	Proccessor	Speed[1]/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	*Uniprocessor, entry server designed to meet small business needs and budgets*
Processor(s)	**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** / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / **PC24200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered / CAS Latency 4 (CL4)
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-20X[6] CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X[6] / 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 1600 x 1200 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
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
48X/32X/48X/16X Max[6] CD-RW/DVD (black)	32R2905
IBM Multi-burner Plus	32R2906
IBM USB Portable Diskette Drive	05K9276
36/72GB DDS/5 Internal Tape Drive	71P9145
VXA-2 Tape Drive	59P6746
IBM 20/40GB TR7 Internal Tape Drive	48P7042
IBM ServeRAID-7t SATA Controller	71P8648
IBM Ultra320 SCSI Controller2	13N2249

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



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 WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

IBM @server™ xSeries™ 206

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

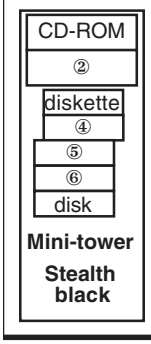
	IBM® Type	Machine GAV	model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Ethernet	Available date
✂	8482	1Mx	11X	Pentium 4®	2.8	1MB	800	512MB	None	SCSI	440.4GB	5 x 7	3 hot-swap	Gigabit	Apr 2004
✂	8482	1Rx	14X	Pentium 4	2.8	1MB	800	512MB	36.4GB U320	SCSI	587.2GB	5 x 7	4 fixed	Gigabit	Apr 2004
✂	8482	1Sx	15X	Pentium 4	2.8	1MB	800	256MB	None	SATA	320GB	5 x 7	2 simple-swap	Gigabit	Apr 2004
	8482	2Mx	21X	Pentium 4	3.0	1MB	800	512MB	None	SCSI	440.4GB	5 x 7	3 hot-swap	Gigabit	Apr 2004
	8482	2Rx	24X	Pentium 4	3.0	1MB	800	512MB	36.4GB U320	SCSI	587.2GB	5 x 7	4 fixed	Gigabit	Apr 2004
	8482	2Sx	25X	Pentium 4	3.0	1MB	800	256MB	None	SATA	320GB	5 x 7	2 simple-swap	Gigabit	Apr 2004
	8482	9Mx	91X	Celeron®	2.4	128KB	800	256MB	80GB SATA	SATA	320GB	5 x 7	2 simple-swap	Gigabit	Apr 2004
✂	8482	3Mx	31X	Pentium 4	3.2	1MB	800	512MB	None	SCSI	440.4GB	5 x 7	3 hot-swap	Gigabit	Jun 2004
✂	8482	3Rx	34X	Pentium 4	3.2	1MB	800	512MB	36.4GB U320	SCSI	587.2GB	5 x 7	4 fixed	Gigabit	Jun 2004
✂	8482	3Sx	35X	Pentium 4	3.2	1MB	800	256MB	None	SATA	320GB	5 x 7	2 simple-swap	Gigabit	Jun 2004

Positioning	*uniprocessor, entry server designed to meet small business needs and budgets*
Processor(s)	**Intel® Pentium 4 2.8, 3.0, or 3.2Ghz with 800MHz frontside bus** (FSB) or Celeron at 2.4GHz
L2 cache	**Up to 1MB** std and max / ECC / full speed
Implementation	Motherboard contains one m478 PGA socket (processor/L2 cache in FC-PGA2), four DIMM sockets, three PCI slots, one AGP slot, ethernet controller, connector for extender board (two PCI slots and graphics controller)
SMP support	No SMP support / no processor upgrade
Memory	**256MB or 512MB** / 4GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / PC3200 supported in all models / **PC2700 333MHz ECC DDR-SDRAM** (models 1xx and 2xx) / **PC3200 400MHz ECC DDR-SDRAM** (models 3xx) / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered / CAS Latency 2.5 (CL2.5) / apart from single-DIMM configurations, memory must be added in matched pairs [a bank]
SCSI disk controller	*Some:* single channel **Ultra320 SCSI controller** (LVD 320MB/sec)
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
SATA disk controller	*Some:* dual channel SATA-150 controller (150MB/sec)
Cables	One 2-drop EIDE cables (to CD-ROM) / *Some:* one 5-drop LVD SCSI cable / *Some:* two 1-drop SATA cables
Disk	*Some:* 36.4GB U320 SCSI / 10,000 rpm / 4.7 ms seek / *Some:* 80GB SATA / 7,200 rpm / 9.0 ms / *All:* S.M.A.R.T.
RAID Controller	IBM ServeRAID™ 7e (RAID 0 or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Rack support	4U[4] rack mount support via tower-to-rack kit option
Bus slots (see below)	One PCI bus / three 32-bit 33MHz 5v PCI 2.2 slots / two 64-bit 66MHz 3.3v PCI-X slots / no hot-swap Active™ PCI slots
Chipset	**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
Ethernet	10/100/1000 gigabit / Intel Kenai II / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN® / Alert Standard Format 2.0
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
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 cntrl	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® 7000M / 16MB SDRAM std/max / PCI 2.2 32-bit 33MHz / on planar / analog 15-pin D-Sub conn
Security	Mechanical side panel key lock / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / cover tamper detect switch
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)
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SCSI models / not redundant / not hot-swap
Power supply	340 watts / universal / auto switch / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)

256MB PC2700 CL2.5 ECC DDR UDIMM	06P4053
512MB PC2700 CL2.5 ECC DDR UDIMM	06P4054
1GB PC2700 CL2.5 ECC DDR UDIMM	06P4055
256MB PC3200 CL2.5 ECC DDR UDIMM	06P4049
512MB PC3200 CL2.5 ECC DDR UDIMM	06P4050
1GB PC3200 CL2.5 ECC DDR UDIMM	06P4051
IBM 80GB 7200 rpm simple-swap SATA-150 HDD	73P8002
IBM 36.4GB 10000 rpm hot-swap U320 HDD	32P0726
32X/10X/40X/16X Max[6] CD-RW/DVD (black)	22P6973
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 4Ux20D Tower-to-Rack Kit	09N4300
IBM ServeRAID-6i+ Controller	13N2190
IBM ServeRAID-7T Controller	71P8648
IBM 20/40GB TR7 Internal Tape Drive	48P7042
IBM 40/80GB DLT1 Internal Half-High Tape Drive	24P2398
IBM NetBAY11 Standard Rack Cabinet	9306110

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

Slot 1: fullsize, 64-bit 66MHz, PCI-X (3.3v)
Slot 2: fullsize, 64-bit 66MHz, PCI-X (3.3v)
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)



Mini-tower
Stealth black

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

- ➪ Metal cage for disk bays 5,6,7 rotate out of chassis for easy access for cabling backplane or working with disks
- ➪ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent componet failure

- ✧ Removable left side panel
- ✧ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
- ✧ Advanced Configuration Power Interface (ACPI) 1.0
- ✧ Device Drivers and Diagnostics CD-ROM included
- ✧ Four stabilizing feet
- ✧ Handle grip on top
- ✧ H 17.25" x W 6.5" x D 19.0"
- ✧ H 448mm x W 165mm x D 483mm
- ✧ 35 to 42 pounds (15.9 to 19.1kg)

Maximum SATA capacity:
320GB[13] (2 disks x 160GB)
Maximum hot-swap SCSI capacity:
439.2GB[13] (3 disks x 146.4GB)
Maximum fixed SCSI capacity:
585.6GB[13] (4 disks x 146.4GB)

LIMITED WARRANTY[3]

- ➪ **1 year parts and labor**
- ➪ **International Warranty Service[3]**
- ➪ **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**
- ➪ **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(X206A) © IBM Corp. March 2004

US models announced March 16, 2004 (1xx, 2xx) or June 8, 2004 (3xx)

✂ = Models Withdrawn December 30, 2004

IBM @server™ xSeries™ 206 (August 2004)

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

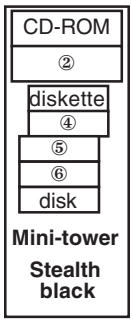
IBM® Machine Type	GAV model	Proccessor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Ethernet	Available date
8482	- 4My -41x	Pentium 4® EM64T	3.2	1MB	800	512MB	None	SCSI	440.4GB	5 x 7	3 hot-swap	Gigabit	Aug 2004
8482	- 4Ry -44x	Pentium 4 EM64T	3.2	1MB	800	512MB	36.4GB U320	SCSI	587.2GB	5 x 7	4 fixed	Gigabit	Aug 2004
8482	- 4Sy -45x	Pentium 4 EM64T	3.2	1MB	800	256MB	None	SATA	500GB	5 x 7	2 simple-swap	Gigabit	Aug 2004
☛ 8482	- 5My -51x	Pentium 4 EM64T	3.4	1MB	800	512MB	None	SCSI	440.4GB	5 x 7	3 hot-swap	Gigabit	Jan 2005
☛ 8842	- 5Ry -54x	Pentium 4 EM64T	3.4	1MB	800	512MB	36.4GB U320	SCSI	587.2GB	5 x 7	4 fixed	Gigabit	Jan 2005
☛ 8842	- 5Sy -55x	Pentium 4 EM64T	3.4	1MB	800	256MB	None	SATA	500GB	5 x 7	2 simple-swap	Gigabit	Jan 2005

Positioning	*Uniprocessor, entry server designed to meet small business needs and budgets*
Processor(s)	**Intel® Pentium 4 3.2 & 3.4 Ghz with 800MHz FSB Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**Up to 1MB** std and max / ECC / full speed
Implementation	Motherboard contains one m478 PGA socket (processor/L2 cache in FC-PGA2), four DIMM sockets, three 33MHz PCI slots, two 66MHz PCI slots, ethernet controller
SMP support	No SMP support / no processor upgrade
Memory	**256MB or 512MB** / 4GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / **PC3200 400MHz ECC DDR-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered / CAS Latency 3 (CL3) / apart from single-DIMM configurations, memory must be added in matched pairs [a bank]
SCSI disk controller	*4My & 4Ry:* **Adaptec® 7901** single channel **Ultra320 SCSI controller** (LVD 320MB/sec)
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
SATA disk controller	*4Sy:* single channel SATA-150 controller (150MB/sec) / supports 2 drives standard / supports 4 drives with adapter
Cables	One 2-drop EIDE cables (to CD-ROM) / *4My & 4Ry:* one 5-drop LVD SCSI cable / *4Sy:* one 2-drop SATA cable
Disk	*4Ry:* 36.4GB U320 SCSI / 10,000 rpm / 4.7 ms seek / S.M.A.R.T.
RAID Controller	IBM ServeRAID™ 7e (RAID 0 or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Rack support	4U[4] rack mount support via tower-to-rack kit option
Bus slots (see below)	One PCI bus / three 32-bit 33MHz 5v PCI 2.2 slots / two 64-bit 66MHz 3.3v PCI-X slots / no hot-swap Active™ PCI slots
Chipset	**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
Ethernet	10/100/1000 gigabit / Intel Kenai II / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN® / Alert Standard Format 2.0
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
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	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 / 16MB SDRAM std/max / on planar / analog 15-pin
Security	Mechanical side panel key lock / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / cover tamper detect switch / ASF 2.0
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)
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SCSI models / not redundant / not hot-swap
Power supply	340 watts / universal / auto switch / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)

256MB PC3200 CL3 ECC DDR UDIMM	06P4049
512MB PC3200 CL3 ECC DDR UDIMM	06P4050
1GB PC3200 CL3 ECC DDR UDIMM	06P4051
IBM 80GB SATA-150 (7.2K) simple-swap HDD	73P8002
IBM 160GB SATA-150 (7.2K) simple-swap HDD	73P8003
IBM 250GB SATA-150 (7.2K) simple-swap HDD	73P8006
IBM 36.4GB 10K hot-swap U320 HDD	32P0726
IBM 73.4GB 10K hot-swap U320 HDD	32P0724
IBM 146.8GB 10K hot-swap U320 HDD	32P0725
IBM 36.4GB 15K hot-swap U320 HDD	90P1318
IBM 73.4GB 15K hot-swap U320 HDD	90P1319
32X/10X/40X/16X Max[6] CD-RW/DVD (black)	22P6973
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 4Ux20D Tower-to-Rack Kit	09N4300
IBM ServeRAID-6i+ Controller	13N2190
IBM ServeRAID-7t SATA Controller	71P8648
IBM 20/40GB TR7 Internal Tape Drive	48P7042
IBM 40/80GB DLT1 Internal Half-High Tape Drive	24P2398

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

Slot 1: fullsize, 64-bit 66MHz, PCI-X (3.3v)
Slot 2: fullsize, 64-bit 66MHz, PCI-X (3.3v)
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)



Mini-tower
Stealth black

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

- Metal cage for disk bays 5,6,7 rotate out of chassis for easy access for cabling backplane or working with disks
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

- Removable left side panel
- Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
- Advanced Configuration Power Interface (ACPI) 1.0
- Device Drivers and Diagnostics CD-ROM included
- Four stabilizing feet
- Handle grip on top
- H 17.25" x W 6.5" x D 19.0"
- H 448mm x W 165mm x D 483mm
- 35 to 42 pounds (15.9 to 19.1kg)

Maximum SATA capacity:
500GB[13] (2 disks x 250GB) w/ optional ServeRAID 7t (4 disks x 1TB)
Maximum hot-swap SCSI capacity:
439.2GB[13] (3 disks x 146.4GB)
Maximum fixed SCSI capacity:
585.6GB[13] (4 disks x 146.4GB)

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

☛ = Models announced January 18, 2005

(X206B) © IBM Corp. January 2005

IBM @server™ xSeries™ 206m

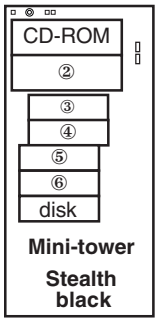
For GAV systems, lowercase "y" should be replaced with a country-specific code.

IBM® Machine Type	GAV-model	Proccessor / 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	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	1Ay-1Ax	Pentium 4 630 3.0GHz	2MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	20y-20x	Pentium 4 640 3.0GHz	2MB	800	512MB	80GB/SATA	1.0TB	4 x 7	4 fixed	1x400W	Gigabit	Oct 2005
8485/8490	2Ay-2Ax	Pentium 4 640 3.2GHz	2MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	3Ay-3Ax	Pentium 4 650 3.2GHz	2MB	800	2x512MB	None/SAS/SATA	1.2TB	4 x 7	4 hot-swap	1x400W	Gigabit	Oct 2005
8485/8490	3By-3Bx	Pentium 4 650 3.2GHz	2MB	800	1GB	None/SAS/SATA	1.2TB	4 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	70y-70x	Pentium D 820 3.4GHz	2x1MB	800	512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	7Ay-7Ax	Pentium D 820 2.8GHz	2x1MB	800	1GB	None/SATA	1.0TB	6 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490	80y-80x	Pentium D 830 3.0GHz	2x1MB	800	512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490	8Ay-8Ax	Pentium D 830 3.0GHz	2x1MB	800	1GB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Oct 2005

Positioning	*Single socket, entry server for small and medium size business' and distributed enteprises*
Processor(s)	**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 / 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-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	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / None standard
Ports	*Front:* two USB (2.0); *Back:* two serial (9-pin), parallel, two USB (2.0), keyboard, mouse, ethernet (RJ45) and monitor
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan speed and failure, and voltages / **secure remote power on/off** / **support for optional Remote Supervisor Adapter II**
Graphics controller	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz
Security	Mechanical side panel key lock / U-Bolt Tie-down capability/ power-on password / boot sequence control / operation without keyboard/mouse
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), **ServeRAID**™ (RAID management), IBM Director (system hardware management software) and many utilities
Keyboard / mouse	Optional
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap
Power supply	Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed)

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
48X/32X/48X/16X Max[6] CD-RW/DVD-ROM Combo (black)	32R2905
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 5Ux20D Tower-to-Rack Kit	39R9361
IBM ServeRAID-7t SATA Integrated Controller	71P8648

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



Mini-tower

Stealth black

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

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

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

- Removable left side panel
- Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
- Advanced Configuration Power Interface (ACPI) 1.0
- Device Drivers and Diagnostics CD-ROM included
- Four stabilizing feet
- H 17.25" x W 8.5" x D 21.25"
- H 448mm x W 215.9mm x D 539.75mm
- 36 to 45.8 pounds (16.3 to 20.8kg)

Maximum SATA capacity:
1TB[13] (4 disks x 250GB)
Maximum hot-swap SAS capacity:
1.2TB[13] (4 disks x 300GB)

LIMITED WARRANTY[3]

- **1 year parts and labor standard 8485 MTM**
- **3 year parts and labor standard 8490 MTM**
- **International Warranty Service[3]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

(X206mA) © IBM Corp. October 2005

IBM @server™ xSeries™ 225 (8649) (January 2004)

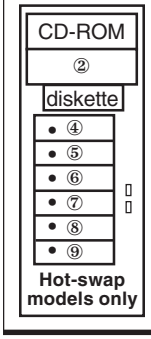
IBM® Type-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8649-42X	1 x Xeon™	2.67	512KB	533	512MB	36.4GB[2] Ultra320 10K	Ultra320	None (4 fixed)	6 x 7	One fixed	Gigabit	Feb 2004
8649-4AX	1 x Xeon	2.67	512KB	533	512MB	None (open-bay)	Ultra320	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) SMP - L2 Cache Implementation	**1 x Intel® Xeon up to 3.06 GHz with 533MHz frontside bus (FSB)** / Hyper-Threading technology **2-way SMP** / up to two Xeon Processors (same speed/cache size) / **512KB** std and max / at processor speed 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 / 8GB[13] 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 SCSI disk controller SCSI channels and cables Cables Disk - features	Enhanced IDE busmaster / ATA-100 / integrated in I/O Controller Hub 4 / two connectors on planar **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 One SCSI cable (listed above), one 2-drop EIDE cable (to CD-ROM) *Some:* 36.4GB Ultra320 SCSI / 10K rpm / 4.7 ms average read seek / S.M.A.R.T.[5]
Rack support Bus slots (see below) Chipset	4U[4] rack mount support via tower-to-rack kit option 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 **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 CD-ROM / diskette Ports Diagnostics Systems mgmt cntrl	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:* 48X-20X[6] 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), microphone-in (mono), line-in (stereo), line-out (stereo) 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® RageXL / on Mini PCI adapter / 8MB SDRAM std and max / PCI 2.2 32-bit 33MHz / analog 15-pin D-Sub conn
Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities
Keyboard / mouse Cooling fans Power supply(s)	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2) up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) *All:* not redundant / not hot-swap / all variable speed *Some:* one 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)

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 Max[6] 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

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



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

Hot-swap models 6AX and 6BX:
Six bays ④ to ⑨ 3.5", SL 1", access, hot-swp

Fixed disk models 62X:
Bay ④ 3.5", SL 1", no access, not hot-swap
Bay ⑤ 3.5", SL 1", no access, not hot-swap
Bay ⑥ 3.5", SL 1", no access, not hot-swap
Bay ⑦ 3.5", SL 1", no access, not hot-swap

Maximum internal SCSI disk capacity[13]:
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 WARRANTY[3]

- ➪ **1 year parts and labor**
- ➪ **International Warranty Service[3]**
- ➪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- ➪ **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 9x5, NBD response** (ServicePac® part num 96P2248)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 96P2249)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2250)
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2251)
- ➪ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ➪ **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

(X225D) © IBM Corp. January 2004

IBM @server™ xSeries™ 226 (8648) (August 2004)

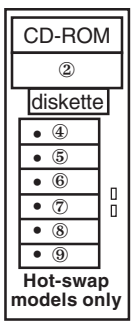
IBM® Type-GAV-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-00y-00x	1 x Xeon™	2.8	1MB	800	512MB	80GB[2] SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit	Sept 2004
8648-0Ay-0Ax	1 x Xeon	2.8	1MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sept 2004
8648-0By-0Bx	1 x Xeon	2.8	1MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sept 2004
8648-10Y-10x	1 x Xeon	3.0	1MB	800	512MB	80GB SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit	Sept 2004
8648-1AY-1Ax	1 x Xeon	3.0	1MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sept 2004
8648-1BY-1Bx	1 x Xeon	3.0	1MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sept 2004
8648-20Y-20x	1 x Xeon	3.2	1MB	800	512MB	80GB SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit	Sept 2004
8648-2AY-2Ax	1 x Xeon	3.2	1MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sept 2004
8648-2BY-2Bx	1 x Xeon	3.2	1MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sept 2004

Processor(s)	**1 x Intel® Xeon up to 3.2 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **1MB L2 ECC Cache** / Hyper-Threading technology
SMP - L2 Cache	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **1MB** std and max / at processor speed
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)
Memory	**512MB** std / 16GB[13] max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater
SATA disk controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e
SCSI disk controller	**Adaptec® 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector
Cables	One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),
RAID Controller	IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Mechanical	4U[4] Tower (rack mount support via tower-to-rack kit option)
Bus slots (see below)	One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots
Chipset	**Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
Ethernet	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
Ports	*Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt cntrl	Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector
Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)
Cooling fans	up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)
Power supply(s)	*All:* not redundant / not hot-swap / all variable speed *Some:* one 530 watt std and max / not hot-swap *xBX:* two 514 watt std and max / hot-swap / redundant *All:* universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)

Xeon 2.80 GHz/800/1MB L2 Cache EM64TProc Upg	13N0671
Xeon 3.00 GHz/800/1MB L2 Cache EM64TProc Upg	13N0672
Xeon 3.2 GHz/800/1MB L2 Cache EM64TProc Upg	13N0673
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	73P2865
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	73P2866
IBM 80GB SATA-150 (7.2K) simple-swap HDD	73P8002
IBM 160GB SATA-150 (7.2K) simple-swap HDD	73P8003
IBM 250GB SATA-150 (7.2K) simple-swap HDD	73P8006
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 Max[6] CD-RW internal (black)	22P6976
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 7t SATA controller	71P8648

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

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

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

- ✧ Raven black color
- ✧ Removable left side panel
- ✧ Configuration/Setup Utility invoked by pressing F1 at startup
- ✧ BIOS Setup Utility via F1 at startup
- ✧ Adaptec Configuration Utility near startup by pressing CTRL+I
- ✧ DMI 2.2-compliant
- ✧ Adv Config Power Interface (ACPI) 1.0a
- ✧ *Device Driver and IBM Enhanced Diagnostics* CD-ROM included
- ✧ Four stabilizing feet
- ✧ Handle grip on top
- ✧ H 18.4" x W 6.5" x D 25.9"
- ✧ H 467mm x W 165mm x D 658mm
- ✧ 44 to 57 pounds (20 to 25.8kg)

- ➪ *Fixed disk models:* metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- ➪ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY[3]

- ➪ **1 year parts and labor**
- ➪ **International Warranty Service**[3]
- ➪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- ➪ **On site service upgrade options (in eligible locations):**[7]
  - **3 year IOR 9x5, NBD response** (ServicePac® part num 96P2248)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 96P2249)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2250)
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2251)
- ➪ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ➪ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

• = Hot-swap bays in some models

(X226A) © IBM Corp. Sept 2004

IBM @server™ xSeries™ 226 (8648) (February 2005)

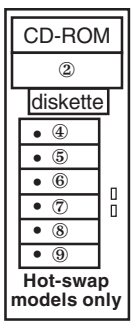
IBM® Type-GAV-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-40y-40x	1 x Xeon™	3.0	2MB	800	512MB	80GB[2] SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit	Mar 2005
8648-4Ay-4Ax	1 x Xeon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

Processor(s)	**1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **2MB L2 ECC Cache** / Hyper-Threading technology
SMP - L2 Cache	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)
Memory	**512MB** std / 16GB[13] max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater
SATA disk controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e
SCSI disk controller	**Adaptec® 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector
Cables	One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),
RAID Controller	IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Mechanical	4U[4] Tower (rack mount support via tower-to-rack kit option)
Bus slots (see below)	One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots
Chipset	**Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
Ethernet	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
Ports	*Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt cntrl	Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector
Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)
Cooling fans	Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)
Power supply(s)	*All:* not redundant / not hot-swap / all variable speed *Some:* one 530 watt std and max / not hot-swap *xBx:* two 514 watt std and max / hot-swap / redundant *All:* universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)

Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg	25R8900
Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg	25R8901
Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg	13N0676
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	73P2865
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	73P2866
IBM 80GB SATA-150 (7.2K) simple-swap HDD	73P8002
IBM 160GB SATA-150 (7.2K) simple-swap HDD	73P8003
IBM 250GB SATA-150 (7.2K) simple-swap HDD	73P8006
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 Max[6] CD-RW internal (black)	22P6976
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 7t SATA controller	71P8648

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

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

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

- ✧ Raven black color
- ✧ Removable left side panel
- ✧ Configuration/Setup Utility invoked by pressing F1 at startup
- ✧ BIOS Setup Utility via F1 at startup
- ✧ Adaptec Configuration Utility near startup by pressing CTRL+I
- ✧ DMI 2.2-compliant
- ✧ Adv Config Power Interface (ACPI) 1.0a
- ✧ *Device Driver and IBM Enhanced Diagnostics* CD-ROM included
- ✧ Four stabilizing feet
- ✧ Handle grip on top
- ✧ H 18.4" x W 6.5" x D 25.9"
- ✧ H 467mm x W 165mm x D 658mm
- ✧ 44 to 57 pounds (20 to 25.8kg)

- ➪ *Fixed disk models:* metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- ➪ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY[3]

- ➪ **1 year parts and labor**
- ➪ **International Warranty Service**[3]
- ➪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- ➪ **On site service upgrade options (in eligible locations):**[7]
  - **3 year IOR 9x5, NBD response** (ServicePac® part num 96P2248)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 96P2249)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2250)
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2251)
- ➪ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ➪ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

• = Hot-swap bays in some models

(X226B) © IBM Corp. February 2005

IBM @server™ xSeries™ 226 (8648) (September 2005)

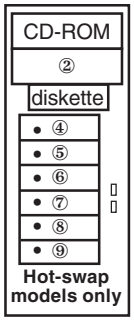
IBM® Type-GAV-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-32U-32x	1 x Xeon™	2.8	2MB	800	512MB	80GB[2] SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit	Sep 2005
8648-34U-34x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sep 2005
8648-36U-36x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005
8648-E3U-E3x	1 x Xeon	2.8	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sep 2005
8648-E5U-E5x	1 x Xeon	2.8	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005
8648-E7U-E7x	1 x Xeon	3.2	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005

Processor(s)	**1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **2MB L2 ECC Cache** / Hyper-Threading technology
SMP - L2 Cache	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)
Memory	**512MB** std / 16GB[13] max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater
SATA disk controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e
SCSI disk controller	**Adaptec® 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector
Cables	One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),
RAID Controller	IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Mechanical	4U[4] Tower (rack mount support via tower-to-rack kit option)
Bus slots (see below)	One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots
Chipset	**Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
Ethernet	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
Ports	*Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt cntrl	Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector
Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)
Cooling fans	Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)
Power supply(s)	*All:* not redundant / not hot-swap / all variable speed *Some:* one 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)

Xeon 2.8 GHz/800/2MB L2 Cache EM64TProc Upg	25R8907
Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg	25R8900
Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg	25R8901
Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg	13N0676
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	73P2865
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	73P2866
IBM 80GB SATA-150 (7.2K) simple-swap HDD	73P8002
IBM 160GB SATA-150 (7.2K) simple-swap HDD	73P8003
IBM 250GB SATA-150 (7.2K) simple-swap HDD	73P8006
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 Max[6] CD-RW internal (black)	22P6976
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 7t SATA controller	71P8648

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

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 7t controller)

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

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

- ✧ Raven black color
- ✧ Removable left side panel
- ✧ Configuration/Setup Utility invoked by pressing F1 at startup
- ✧ BIOS Setup Utility via F1 at startup
- ✧ Adaptec Configuration Utility near startup by pressing CTRL+I
- ✧ DMI 2.2-compliant
- ✧ Adv Config Power Interface (ACPI) 1.0a
- ✧ *Device Driver and IBM Enhanced Diagnostics* CD-ROM included
- ✧ Four stabilizing feet
- ✧ Handle grip on top
- ✧ H 18.4" x W 6.5" x D 25.9"
- ✧ H 467mm x W 165mm x D 658mm
- ✧ 44 to 57 pounds (20 to 25.8kg)

- ➪ *Fixed disk models:* metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- ➪ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY[3]

- ➪ **1 year parts and labor**
- ➪ **International Warranty Service[3]**
- ➪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- ➪ **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 9x5, NBD response** (ServicePac® part num 96P2248)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 96P2249)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2250)
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2251)
- ➪ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ➪ **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

• = Hot-swap bays in some models

(X226C) © IBM Corp. September 2005

IBM @server™ xSeries™ 226 (8848) (September 2005)

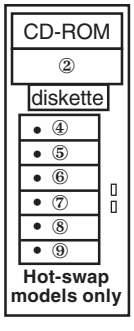
IBM® Type-GAV-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8848-32U-32x	1 x Xeon™	2.8	2MB	800	512MB	80GB[2] SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit	Sep 2005
8848-34U-34x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sep 2005
8848-36U-36x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005

Processor(s)	**1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **2MB L2 ECC Cache** / Hyper-Threading technology
SMP - L2 Cache	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)
Memory	**512MB** std / 16GB[13] max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater
SATA disk controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e
SCSI disk controller	**Adaptec® 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector
Cables	One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),
RAID Controller	IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Mechanical	4U[4] Tower (rack mount support via tower-to-rack kit option)
Bus slots (see below)	One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots
Chipset	**Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
Ethernet	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
Ports	*Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt cntrl	Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector
Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)
Cooling fans	Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)
Power supply(s)	Not redundant / not hot-swap / all variable speed / One 530 watt std and max / not hot-swap / universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)

Xeon 2.8 GHz/800/2MB L2 Cache EM64TProc Upg	25R8907
Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg	25R8900
Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg	25R8901
Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg	13N0676
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	73P2865
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	73P2866
IBM 80GB SATA-150 (7.2K) simple-swap HDD	73P8002
IBM 160GB SATA-150 (7.2K) simple-swap HDD	73P8003
IBM 250GB SATA-150 (7.2K) simple-swap HDD	73P8006
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 Max[6] CD-RW internal (black)	22P6976
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 7t SATA controller	71P8648

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

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

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

- ✧ Raven black color
- ✧ Removable left side panel
- ✧ Configuration/Setup Utility invoked by pressing F1 at startup
- ✧ BIOS Setup Utility via F1 at startup
- ✧ Adaptec Configuration Utility near startup by pressing CTRL+I
- ✧ DMI 2.2-compliant
- ✧ Adv Config Power Interface (ACPI) 1.0a
- ✧ *Device Driver and IBM Enhanced Diagnostics* CD-ROM included
- ✧ Four stabilizing feet
- ✧ Handle grip on top
- ✧ H 18.4" x W 6.5" x D 25.9"
- ✧ H 467mm x W 165mm x D 658mm
- ✧ 44 to 57 pounds (20 to 25.8kg)

- ➪ *Fixed disk models:* metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
- ➪ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY[3]

- ➪ **1 year parts and labor**
- ➪ **International Warranty Service[3]**
- ➪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- ➪ **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 9x5, NBD response** (ServicePac® part num 96P2248)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 96P2249)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2250)
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2251)
- ➪ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ➪ **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

• = Hot-swap bays in some models

(X226D) © IBM Corp. September 2005

IBM @server™ xSeries™ 235 (January 2004)

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

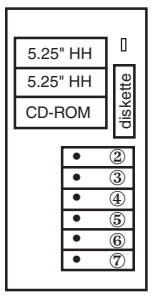
These models ship standard with **Non-Chipkill DIMMs**. Chipkill is **optionally available** with purchase of 512MB DIMMs or higher.

Positioning	*Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
Processor(s)	Up to **1 x Intel® Xeon™ Processor 3.06 GHz** with 533MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / all models / on die of processor / at processor speed
L3 cache	**1MB** / available on some 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 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 (5U[4]) via optional kit for support in IBM NetBAY™ Racks
Chipset	**ServerWorks® Grand Champion™ 4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / two CIOB-X2 I/O Bridges (IMB2 bus to Host Bridge for PCI-X 1.0 Bus B with slots 2, 3, 4 and Ultra320 and ethernet controllers; IMB2 bus to Host Bridge for PCI-X 1.0 Bus C with slots 5 and 6) / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2 bus A with slot 1 and graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / NS PC87417 Super I/O
Ethernet controller	10/100/1000 gigabit / Broadcom® BCM 5703 / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format
CD-ROM / diskette	48X-20X[6] CD-ROM / IDE / 1.6" HH; *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 *M1X*: std/max: one/two 660 watt *xAX*: std/max: two/two 560 watt *Rest*: std/max: one/two 560 watt *All:* voltage-sensing / auto-restart / fan in each
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

Other options at **ibm.com**/pc/us/accessories
*Not backward compatible with 400Mhz FSB x235

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



Tower

Bay ① 3.5", SL 1", access, diskette
Bay ② 3.5", SL 1", access, hot-swap
Bay ③ 3.5", SL 1", access, hot-swap
Bay ④ 3.5", SL 1", access, hot-swap
Bay ⑤ 3.5", SL 1", access, hot-swap
Bay ⑥ 3.5", SL 1", access, hot-swap
Bay ⑦ 3.5", SL 1", access, hot-swap
Bay ⑧ 5.25", HH 1.6" access, open**
Bay ⑨ 5.25", HH 1.6" access, open**
Bay ⑩ 5.25", HH 1.6" access, CD-ROM

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

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- LSI Logic Configuration Utility near startup by pressing CTRL+C
- Diagnostics (PC-Doctor™) by pressing F2 at startup
- ACPI 2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Tower: H 17.31" x W 8.5" x D 27.6"
- 74 to 101 pounds
- Stealth black color

All models: Max int disk capacity: 1.321TB[2] with nine 146.8GB SL disks with 3-Pack Ultra160 Hot-Swap Expansion Kit

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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)
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information
US models announced January 20, 2004
✂ = Models withdrawn from marketing effective December 30, 2004

• = Hot-swap

(X235C) © IBM Corp. January 2004

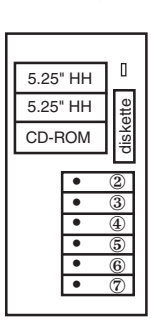
IBM® Type-model	Qty x Processor	L2 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8841-01y-01x	1 x Xeon® 2.8GHz	1MB	512MB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Aug 2004
8841-11y-11x	1 x Xeon 3.0GHz	1MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Aug 2004
8841-21y-21x	1 x Xeon 3.2GHz	1MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Aug 2004
8841-31y-31x	1 x Xeon 3.4GHz	1MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Aug 2004
8841-32y-32x	1 x Xeon 3.4GHz	1MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	2 x 670W hot-swap	2xGigabit	Aug 2004
8841-41y-41x	1 x Xeon 3.6GHz	1MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Aug 2004

Positioning	*Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
Processor	Up to **1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6 GHz** with 800MHz frontside bus / **Extended Memory 64 Technology (EM64T)** / **Simultaneous Multi-threading** (SMT) / Hyper-Threading technology /
L2 cache	**1MB** / 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	**512MB** or **1MB** 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 / 16-bit Checksum Chipkill™ optionally available**, requiring 512MB DIMMs or greater
SCSI disk controller	**Adaptec AIC 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / **HostRAID** supports **RAID-0, 1 mirroring** with up to one hot-spare disk / optional IBM ServeRAID™-7k Controller for low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10, 50 (installed on internal connector)
SCSI channels	Two 16-bit channels / *SCSI Channel B:* 16-bit 68-pin LVD cable from controller to backplane; *Channel A:* 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 24P7973) or via opt ServeRAID adapter with external connector(s)
IDE controller / cable	Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)
Disk - capacity	None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks
Mechanical	Tower / conversion to EIA 19" Rack (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; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* two USB (Vers 2.0), keyboard, mouse, parallel, **one** serial (9-pin),graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)
Front port / graphics	*Front:* one USB (Vers 2.0); *Graphics:* SVGA / ATI® Radeon™ 7000M / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2
Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot
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/1MB L2 Cache Proc Upg	13N0681
Xeon 3.4GHz/1MB L2 Cache Proc Upg	13N0684
Xeon 3.6GHZ/1MB L2 Cache Proc Upg	13N0685
512MB (2x256) PC2-3200 CL3 ECC DDR2 non-Chipk	73P3523
1GB (2x512) PC2-3200 CL3 ECC DDR2 non-Chipk	73P3522
1GB (2x512) PC2-3200 CL3 ECC DDR2 RDIMM	73P2865
2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM	73P2866
73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0727
146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0728
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	06P5776
73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	32P0735
IBM ServeRAID-7k Controller	71K8642
IBM Remote Supervisor Adapter II Slimline	73P9341
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
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

Slot 1: half-length, 32-bit 33MHz 5v PCI 2.2, Bus A
Slot 2: full, PCI-Express x8, Bus B
Slot 3: full, PCI-Express x8, 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



Tower

Bay ① 3.5", SL 1", access, diskette
Bay ② 3.5", SL 1", access, hot-swap
Bay ③ 3.5", SL 1", access, hot-swap
Bay ④ 3.5", SL 1", access, hot-swap
Bay ⑤ 3.5", SL 1", access, hot-swap
Bay ⑥ 3.5", SL 1", access, hot-swap
Bay ⑦ 3.5", SL 1", access, hot-swap
Bay ⑧ 5.25", HH 1.6" access, open**
Bay ⑨ 5.25", HH 1.6" access, open**
Bay ⑩ 5.25", HH 1.6" access, CD-ROM

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

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- Adaptec Configuration Utility near startup by pressing CTRL+I
- Diagnostics (PC-Doctor™) by pressing F2 at startup
- ACPI 2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Tower: H 17.31" x W 8.5" x D 27.6"
- 74 to 101 pounds
- Stealth black color

All models: Max int disk capacity: 1.2TB[2] with nine 146.4GB SL disks with 3-Pack Ultra160 Hot-Swap Expansion Kit

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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)
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

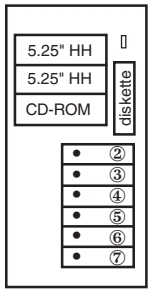
IBM® Type-model	Qty x Processor	L2 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8841-05U-05x	1 x Xeon 2.8GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Sep 2005
8841-15y-15x	1 x Xeon® 3.0GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-25y-25x	1 x Xeon 3.2GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-35y-35x	1 x Xeon 3.4GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-45y-45x	1 x Xeon 3.6GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-16y-16x	1 x Xeon 3.0GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-E1y-E1x	1 x Xeon 3.0GHz	2MB	2GB	3x73.4GB	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-E2y-E2x	2 x Xeon 3.2GHz	2MB	2GB	3x73.4GB	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Mar 2005
8841-55U-55x	1 x Xeon 3.8GHz	2MB	1GB	None	2 x Ultra320	Tower	6x10 (6 hot-swap std; 9 max)	1 x 670W hot-swap	2xGigabit	Sep 2005

Positioning	*Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
Processor	Up to **1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6, 3.8 GHz** with 800MHz frontside bus / **Extended Memory 64 Technology (EM64T)** / **Simultaneous Multi-threading** (SMT) / Hyper-Threading technology /
L2 cache	**2MB** / all models / on die of processor / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, eight memory gold-connector DIMM slots, six PCI slots (one hot-swap Active™ PCI slots), and integrated SCSI, ethernet, graphics
Memory	**1GB** std / 16GB max / two slots used / six slots available / **PC2-3200** 400MHz registered 240-pin ECC **DDR2**-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2x200MHz / **Error Checking and Correcting (ECC)** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / **Active Memory™: memory mirroring, online-spare memory**
SCSI disk controller	**Adaptec AIC 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / **HostRAID** supports **RAID-0, 1 mirroring** with up to one hot-spare disk / optional IBM ServeRAID™-7k Controller for low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10, 50 (installed on internal connector)
SCSI channels	Two 16-bit channels / *SCSI Channel B:* 16-bit 68-pin LVD cable from controller to backplane; *Channel A:* 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 24P7973) or via opt ServeRAID adapter with external connector(s)
IDE controller / cable	Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)
Disk - capacity	None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks
Mechanical	Tower / conversion to EIA 19" Rack (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; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* two USB (Vers 2.0), keyboard, mouse, parallel, **one** serial (9-pin),graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)
Front port / graphics	*Front:* one USB (Vers 2.0); *Graphics:* SVGA / ATI® Radeon™ 7000M / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2
Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot
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	25R8907
Xeon 3.0GHz/2MB L2 Cache Proc Upg	25R8902
Xeon 3.2GHz/2MB L2 Cache Proc Upg	25R8903
Xeon 3.4GHZ/2MB L2 Cache Proc Upg	13N0686
Xeon 3.6GHz/2MB L2 Cache Proc Upg	13N0687
Xeon 3.8GHz/2MB L2 Cache Proc Upg	13N0689
512MB (2x256) PC2-3200 CL3 ECC DDR2 non-Chipk	73P3523
1GB (2x512) PC2-3200 CL3 ECC DDR2 non-Chipk	73P3522
1GB (2x512) PC2-3200 CL3 ECC DDR2 RDIMM	73P2865
2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM	73P2866
73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0727
146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0728
73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	32P0735
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

Slot 1: half-length, 32-bit 33MHz 5v PCI 2.2, Bus A
Slot 2: full, PCI-Express x8, Bus B
Slot 3: full, PCI-Express x8, 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



Tower

Bay ① 3.5", SL 1", access, diskette
Bay ② 3.5", SL 1", access, hot-swap
Bay ③ 3.5", SL 1", access, hot-swap
Bay ④ 3.5", SL 1", access, hot-swap
Bay ⑤ 3.5", SL 1", access, hot-swap
Bay ⑥ 3.5", SL 1", access, hot-swap
Bay ⑦ 3.5", SL 1", access, hot-swap
Bay ⑧ 5.25", HH 1.6" access, open**
Bay ⑨ 5.25", HH 1.6" access, open**
Bay ⑩ 5.25", HH 1.6" access, CD-ROM

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

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- Adaptec Configuration Utility near startup by pressing CTRL+I
- Diagnostics (PC-Doctor™) by pressing F2 at startup
- ACPI 2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Tower: H 17.31" x W 8.5" x D 27.6"
- 74 to 101 pounds
- Stealth black color

All models: Max int disk capacity: 1.2TB[2] with nine 146.4GB SL disks with 3-Pack Ultra160 Hot-Swap Expansion Kit

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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)
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information • = Hot-swap

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IBM @server™ xSeries™ 255 (June 2003)

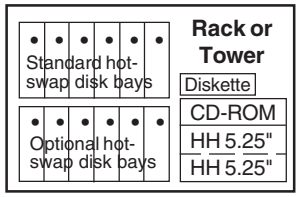
IBM® Type-model	Qty x Processor	L3 cache	Memory	ECC memory features	Disk	SCSI controller	Mech-anical	Slots x disk bays	bays (std/max)	Ethernet	Available date
8685-71X	1 x Xeon™ MP 2.0GHz	1MB	512MB	Hot Spare/Chipkill™	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Jun 2003
8685-7RX	1 x Xeon MP 2.0GHz	1MB	512MB	Hot Spare/Chipkill	None	2 x Ultra160	Rack	7 x10	6/12	Gigabit	Jun 2003
✂ 8685-72X	2 x Xeon MP 2.0GHz	1MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Nov 2003
✂ 8685-73X	2 x Xeon MP 2.0GHz	1MB	3GB	Hot Spare/Chipkill	2 x 36.4GB 10K	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Nov 2003
✂ 8685-81X	1 x Xeon MP 2.5GHz	1MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Jun 2003
✂ 8685-8RX	1 x Xeon MP 2.5GHz	1MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Rack	7 x10	6/12	Gigabit	Jun 2003
✂ 8685-91X	1 x Xeon MP 2.8GHz	2MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Jun 2003
✂ 8685-9RX	1 x Xeon MP 2.8GHz	2MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Rack	7 x10	6/12	Gigabit	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	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI-X slots, one PCI slot, and integrated SCSI, ethernet, graphics
Memory	Up to **3GB** std / 24GB[13] max / two (or six on 73X) slots used / ten (or six) slots available / **PC1600** 200MHz registered 184-pin ECC DDR-SDRAM DIMMs / one memory-board std with 12 DIMM gold-connector slots / DIMMs must be installed in matched pairs or quads [a bank] / 2- or 4-way memory interleave / **Hot Spare Memory** (activated by failure of a pair or quad of DIMMs [a bank]; reqs additional memory matching failed bank) / **Active Memory™ via memory mirroring** (memory mirroring supported with any OS) / **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-7899 / Wide Ultra160 SCSI (LVD 160MB/sec) / two channel / 64-bit 66MHz PCI 2.2 / integrated on planar
SCSI connectors	*Channel B:* 68-pin connector on planar to SCSI backplane (one-drop 16-bit LVD cable) / *Channel A:* 68-pin connector on planar for optional one-drop 16-bit LVD cable (32P8164) to rear 0.8mm VHDCI connector
IDE controller / cabling	Enhanced IDE ATA-100 controller in CSB5 South Bridge / one one-drop IDE cable from IDE controller to CD-ROM
Disk - capacity	None (or two) standard / supports up to 15,000 rpm disks / 80-pin SCA-2 connectors
Disk - bays	*Std:* six hot-swap disk bays; *max:* six additional bays (via a SCSI backplane) with optional Upgrade Kit; *All:* Ultra320-enabled
Mechanical	**EIA 19" rack (7U[4]) or tower** / tower models have hinged and lockable front door, side panels, casters
Rack / conversion	Rack systems supported in IBM NetBAY™ racks / kit available to convert tower to rack (use NetBAY11 for rack to tower)
Architecture / chipset	**ServerWorks® Grand Champion™ 4.0 HE** / CMIC Host Bridge (Memory Controller and I/O Bridge) and five REMCs / two CIOB-X I/O Bridges (IMB bus to Host Bridge, one with two PCI-X buses C and D, other with one PCI-X bus B and ethernet and one PCI 2.2 bus for SCSI / CSB5 South Bridge (Thin IMB to Host Bridge, one PCI 2.2 bus A, EIDE, USB, SMBus, IOAPIC, LPC bus to Super I/O) / five peer PCI buses / NS PC87417 Super I/O (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 / 3.3 volt or universal
Ethernet controller	10/100/1000 gigabit ethernet / Broadcom® BCM 5703 / on PCI Bus B / full duplex / Wake on LAN® / Alert Standard Format 1.0
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE (ATAPI), 1.6" HH, bootable / *Diskette drive:* 3.5" 1.44 MB diskette drive, dust cover
Rear ports	Four USB (Vers 1.1), one serial (9-pin), keyboard (PS/2), mouse (PS/2), ethernet (RJ-45), graphics (DB-15), two RJ-45 (for integrated system management processor) / no parallel port
Graphics controller	SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / up to 1280x1024 at 85Hz / 32-bit 33MHz PCI 2.2 Bus A
Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button (tower only) / unattended boot / selectable boot
Systems management	**IBM integrated system management processor** (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supplies / supports optional Remote Supervisor Adapter with 20-pin connector on planar for continuous power (no external power req)
Diagnostics	**Light Path Diagnostics™** panel providing LED map to failing part (under top cover) / Information LED Panel in front
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, and others
Keyboard / mouse	*Tower only:* IBM 103-key keyboard / IBM mouse (both black)
Power supply	*Std:* two 370 watt hot-swap; *Max:* four 370 watt hot-swap / redundant with four power supplies / tool-free install / universal (voltage sensing) / fans in each power supply / PFA
Fans	Nine **hot-swap redundant fans** / plus fan in each power supply/ variable speed / PFA / fan failure signals diagnostic LED

512MB PC1600 ECC DDR SDRAM RDIMM	33L3283
1GB PC1600 ECC DDR SDRAM RDIMM	33L3285
2GB PC1600 ECC DDR SDRAM RDIMM	33L3287
Xeon MP 2.0GHz/1MB L3 Cache Proc Upg	73P8805
Xeon MP 2.5GHz/1MB L3 Cache Proc Upg	73P8806
Xeon MP 2.8GHz/2MB L3 Cache Proc Upg	73P8807
6-pack Ultra320 Hot-Swap Expansion Kit	32P8163
370 watt Hot-Swap Redundant Power Supply	31P6133
IBM 7U x 26D Tower-to-Rack Conversion Kit III	32P1474
IBM External SCSI Interface Kit (for rear SCSI)	32P8164
Media Bay Cable Kit (2-drop SCSI to HH bays)	10K2340
IBM ServeRAID™-4H Ultra160 SCSI Adapter	37L6889
IBM 36.4GB 10K Ultra160 SCSI Hot-Swap SL	06P5755
IBM 73.4GB 10K Ultra160 SCSI Hot-Swap SL	06P5756
IBM Remote Supervisor Adapter II	59P2984
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1

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

- Tower dim: H15.5" x W17.6" x D29.8"; 104 to 150 lb
- Rack dim: H12.0" x W17.6" x D27.7"; 104 to 150 lb



- Black color
- ACPI 1.0
- Orange components and labels indicate hot-swap options
- Vital Product Data
- Backup BIOS

Bay ① 3.5", SL 1", access, diskette
Bay ② 5.25", HH 1.6" access, CD-ROM
Bay ③ 5.25", HH 1.6" access, open*
Bay ④ 5.25", HH 1.6" access, open*
Bays 5 to 10 (six bays):
standard 3.5" SL 1" hot-swap disk bays
Bays 11 to 16 (six bays):
optional 3.5" SL 1" hot-swap disk bays

Slot 1: 32-bit 33MHz 5v PCI, not hot-swap, Bus A; primarily for for optional Remote Supervisor Adp
Slot 2: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B
Slot 3: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B
Slot 4: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C
Slot 5: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C
Slot 6: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D
Slot 7: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D

- Setup Program is available by pressing F1 at startup; Diagnostics (PC-Doctor) by pressing F2 at startup; CTRL+A for SCSISelect Utility
- Removeable top cover
- Access adapters, memory, CPUs from top
- Predictive Failure Analysis®: alerts generated by mgmt processor for IBM Director for DIMM(s), processor(s),VRM(s), power supply(s), disk(s), and fans

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

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service**[3]
- **On site, 8 am-5 pm, Mon-Fri coverage excluding holidays, next business day response time**[7]
- **On site service upgrade options (in eligible locations):**[7]
  - **3 year IOR 9x5, 4 hr avg resp.** (ServicePac® part num 41L2738)
  - **3 year IOR 24x7, 2 hr avg resp** (ServicePac part num 31L2723)
  - **5 year IOR 9x5, 4 hr avg resp.** (ServicePac part num 69P9223)
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information • = Hot-swap

(X255C) © IBM Corp. November 2003

US models announced June 2003 or November 2003

✂ Models withdrawn from marketing effective March 2004 (72X, 73X) and June 29, 2004 (81X, 8RX, 91X, 9RX)

IBM @server™ xSeries™ 255 (March 2004)

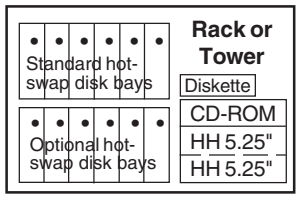
IBM® Type-model	Qty x Processor	L3 cache	Memory	ECC memory features	Disk	SCSI controller	Mech-anical	Slots x disk bays	bays (std/max)	Ethernet	Available date
8685-A1X	1 x Xeon™ MP 2.2GHz	2MB	512MB	Hot Spare/Chipkill™	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Mar 2004
8685-ARX	1 x Xeon MP 2.2GHz	2MB	512MB	Hot Spare/Chipkill	None	2 x Ultra160	Rack	7 x10	6/12	Gigabit	Mar 2004
8685-B1X	1 x Xeon MP 2.7GHz	2MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Mar 2004
8685-BRX	1 x Xeon MP 2.7GHz	2MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Rack	7 x10	6/12	Gigabit	Mar 2004
8685-C1X	1 x Xeon MP 3.0GHz	4MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Mar 2004
8685-CRX	1 x Xeon MP 3.0GHz	4MB	1GB	Hot Spare/Chipkill	None	2 x Ultra160	Rack	7 x10	6/12	Gigabit	Mar 2004
8685-7EX	2 x Xeon MP 2.0 GHz	1MB	4GB	Hot Spare/Chipkill	3 x 73GB - 10k	2 x Ultra160	Tower	7 x10	6/12	Gigabit	Nov 2004

Processors	**1 x Intel® Xeon™ Processor MP 2.0, 2.2, 2.7, or 3.0GHz**[1] with 400MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed
L3 cache	**1MB, 2MB** or **4MB** / on die of processor / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI-X slots, one PCI slot, and integrated SCSI, ethernet, graphics
Memory	Up to **4GB** std / 24GB[13] max / *512 &1GB:* two slots used *4GB*: 4 slots used / twelve slots / **PC1600** 100MHz registered 184-pin ECC DDR-SDRAM DIMMs / one memory-board std with 12 DIMM gold-connector slots / DIMMs must be installed in matched pairs or quads [a bank] / 2- or 4-way memory interleave / **Hot Spare Memory** (activated by failure of a pair or quad of DIMMs [a bank]; reqs additional memory matching failed bank) / **Active Memory™ via memory mirroring** (memory mirroring supported with any OS) / **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-7899 / Wide Ultra160 SCSI (LVD 160MB/sec) / two channel / 64-bit 66MHz PCI 2.2 / integrated on planar
SCSI connectors	*Channel B:* 68-pin connector on planar to SCSI backplane (one-drop 16-bit LVD cable) / *Channel A:* 68-pin connector on planar for optional one-drop 16-bit LVD cable (32P8164) to rear 0.8mm VHDCI connector
IDE controller / cabling	Enhanced IDE ATA-100 controller in CSB5 South Bridge / one one-drop IDE cable from IDE controller to CD-ROM
Disk - capacity	*7EX*: 3 x 73GB - 10K / supports up to 15,000 rpm disks / 80-pin SCA-2 connectors
Disk - bays	*Std:* six hot-swap disk bays; *max:* six additional bays (via a SCSI backplane) with optional Upgrade Kit; *All:* Ultra320-enabled
Mechanical	**EIA 19" rack (7U[4]) or tower** / tower models have hinged and lockable front door, side panels, casters
Rack / conversion	Rack systems supported in IBM NetBAY™ racks / kit available to convert tower to rack (use NetBAY11 for rack to tower)
Architecture / chipset	**ServerWorks® Grand Champion™ 4.0 HE** / CMIC Host Bridge (Memory Controller and I/O Bridge) and five REMCs / two CIOB-X I/O Bridges (IMB bus to Host Bridge, one with two PCI-X buses C and D, other with one PCI-X bus B and ethernet and one PCI 2.2 bus for SCSI / CSB5 South Bridge (Thin IMB to Host Bridge, one PCI 2.2 bus A, EIDE, USB, SMBus, IOAPIC, LPC bus to Super I/O) / five peer PCI buses / NS PC87417 Super I/O (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 / 3.3 volt or universal
Ethernet controller	10/100/1000 gigabit ethernet / Broadcom® BCM 5703 / on PCI Bus B / full duplex / Wake on LAN® / Alert Standard Format 1.0
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE (ATAPI), 1.6" HH, bootable / *Diskette drive:* 3.5" 1.44 MB diskette drive, dust cover
Rear ports	Four USB (Vers 1.1), one serial (9-pin), keyboard (PS/2), mouse (PS/2), ethernet (RJ-45), graphics (DB-15), two RJ-45 (for integrated system management processor) / no parallel port
Graphics controller	SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / up to 1280x1024 at 85Hz / 32-bit 33MHz PCI 2.2 Bus A
Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button (tower only) / unattended boot / selectable boot
Systems management	**IBM integrated system management processor** (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supplies / supports optional Remote Supervisor Adapter with 20-pin connector on planar for continuous power (no external power req)
Diagnostics	**Light Path Diagnostics™** panel providing LED map to failing part (under top cover) / Information LED Panel in front
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, and others
Keyboard / mouse	*Tower only:* IBM 103-key keyboard / IBM mouse (both black)
Power supply	*Std:* two 370 watt hot-swap; *Max:* four 370 watt hot-swap / redundant with four power supplies / tool-free install / universal (voltage sensing) / fans in each power supply / PFA
Fans	Nine **hot-swap redundant fans** / plus fan in each power supply/ variable speed / PFA / fan failure signals diagnostic LED

512MB PC1600 ECC DDR SDRAM RDIMM	33L3283
1GB PC1600 ECC DDR SDRAM RDIMM	33L3285
2GB PC1600 ECC DDR SDRAM RDIMM	33L3287
Xeon MP 2.0GHz/1MB L3 Cache Proc Upg	73P8805
Xeon MP 2.5GHz/1MB L3 Cache Proc Upg	73P8806
Xeon MP 2.8GHz/2MB L3 Cache Proc Upg	73P8807
6-pack Ultra320 Hot-Swap Expansion Kit	32P8163
370 watt Hot-Swap Redundant Power Supply	31P6133
IBM 7U x 26D Tower-to-Rack Conversion Kit III	32P1474
IBM External SCSI Interface Kit (for rear SCSI)	32P8164
Media Bay Cable Kit (2-drop SCSI to HH bays)	10K2340
IBM ServeRAID™-4H Ultra160 SCSI Adapter	37L6889
IBM 36.4GB 10K Ultra160 SCSI Hot-Swap SL	06P5755
IBM 73.4GB 10K Ultra160 SCSI Hot-Swap SL	06P5756
IBM Remote Supervisor Adapter II	59P2984
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1

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

- Tower dim: H15.5" x W17.6" x D29.8"; 104 to 150 lb
- Rack dim: H12.0" x W17.6" x D27.7"; 104 to 150 lb



- Black color
- ACPI 1.0
- Orange components and labels indicate hot-swap options
- Vital Product Data
- Backup BIOS

Bay ① 3.5", SL 1", access, diskette
Bay ② 5.25", HH 1.6" access, CD-ROM
Bay ③ 5.25", HH 1.6" access, open*
Bay ④ 5.25", HH 1.6" access, open*
Bays 5 to 10 (six bays):
standard 3.5" SL 1" hot-swap disk bays
Bays 11 to 16 (six bays):
optional 3.5" SL 1" hot-swap disk bays

Slot 1: 32-bit 33MHz 5v PCI, not hot-swap, Bus A; primarily for for optional Remote Supervisor Adp
Slot 2: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B
Slot 3: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B
Slot 4: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C
Slot 5: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C
Slot 6: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D
Slot 7: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D

- Setup Program is available by pressing F1 at startup; Diagnostics (PC-Doctor) by pressing F2 at startup; CTRL+A for SCSISelect Utility
- Removeable top cover
- Access adapters, memory, CPUs from top
- Predictive Failure Analysis®: alerts generated by mgmt processor for IBM Director for DIMM(s), processor(s),VRM(s), power supply(s), disk(s), and fans

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

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service**[3]
- **On site, 8 am-5 pm, Mon-Fri coverage excluding holidays, next business day response time**[7]
- **On site service upgrade options (in eligible locations):**[7]
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac® part num 41L2738)
  - **3 year IOR 24x7, 2 hr avg resp** (ServicePac part num 31L2723)
  - **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9223)
- **http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

• = Hot-swap

US models announced March 2004

(X255D) © IBM Corp. March 2004

IBM @server™ xSeries™ 260 (August 2005)

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

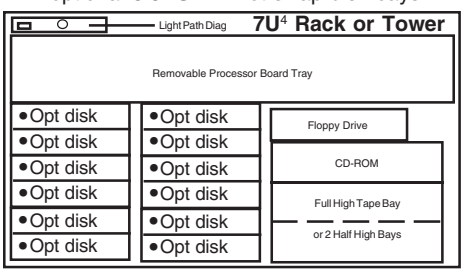
Processors	**One or two 64-bit Intel® Xeon™ Processor MP 3.16 or 3.66GHz**[1] with 667MHz frontside bus std / **NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading technology
L2 cache	**1MB** / on die of processor / at processor speed / **XceL4v™** Dynamic Server Cache
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics
Active Memory™	Up to **4GB** std / 64GB max[12,13] (with 4GB DIMMs) using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)
SAS disk controller	*ALL*: Adaptec® AIC-9410 / **Dual-channel Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0
SAS connectors	Dual channel Controller wired to dual SAS backplanes
SAS cabling	Hot-swap bays connect to integrated SAS controller through SAS expander, 1 cable for each of the 2 SAS backplanes
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	Max: 3.6TB-10k / supports up to 15,000 rpm disks
Disk - bays	**Up to Twelve** 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays
Mechanical	**EIA 19" rack models (7U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64e™ 3rd Generation chipset** / IBM Integrated Processor/Memory Controller (improved performance from earlier models) / 2 IBM PCI-X 2.0 Host Bridges / 1 supports adapter PCI 33MHz and 66MHz, slot for optional ServeRAID 8i (inc. graphics), ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge supports 4 PCI-X 2.0 slots
I/O Slots	Six total Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette	IBM 24X Max SlimLine CD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / *Front:* USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	BMC standard / **Remote Supervisor Adapter II** slimline (optional) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop-down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, and others
Keyboard / mouse	Rack model: none standard / Tower model: IBM 104-key keyboard (PS/2) / IBM 3-button optical mouse (PS/2)
Power supplies	*Std:* two 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor

Options				
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

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service**[3]
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
- **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**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

Bay ① 3.5", SL 1", access, diskette
Bay ② 5.25", HH 1.6" access, CD-ROM
Bay ③ 5.25", HH 1.6" access, open*
Bay ④ 5.25", HH 1.6" access, open*
Bays 5 to 10 (six bays):
standard 3.5" SL 1" hot-swap disk bays
Bays 11 to 16 (six bays):
optional 3.5" SL 1" hot-swap disk bays



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

All models: Maximum internal disk capacity: 3.6TB with 12x 300GB[2] hot-swap SAS disks

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

See footnotes for important warranty information • = Hot-swap

(X260A) © IBM Corp. Aug 2005

IBM @server™ xSeries™ 260 (August 2005)

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

Processors	**One or two 64-bit Intel® Xeon™ Processor MP 3.16 or 3.66GHz**[1] with 667MHz frontside bus std / **NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading technology
L2 cache	**1MB** / on die of processor / at processor speed / **XceL4v™** Dynamic Server Cache
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics
Active Memory™	Up to **4GB** std / 64GB max[12,13] (with 4GB DIMMs) using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)
SAS disk controller	*ALL*: Adaptec® AIC-9410 / **Dual-channel Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0
SAS connectors	Dual channel Controller wired to dual SAS backplanes
SAS cabling	Hot-swap bays connect to integrated SAS controller through SAS expander, 1 cable for each of the 2 SAS backplanes
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	Max: 3.6TB-10k / supports up to 15,000 rpm disks
Disk - bays	**Up to Twelve** 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays
Mechanical	**EIA 19" rack models (7U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64e™ 3rd Generation chipset** / IBM Integrated Processor/Memory Controller (improved performance from earlier models) / 2 IBM PCI-X 2.0 Host Bridges / 1 supports adapter PCI 33MHz and 66MHz, slot for optional ServeRAID 8i (inc. graphics), ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge supports 4 PCI-X 2.0 slots
I/O Slots	Six total Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette	IBM 24X Max SlimLine CD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / *Front:* USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	BMC standard / **Remote Supervisor Adapter II** slimline (optional) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop-down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, and others
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* two 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor

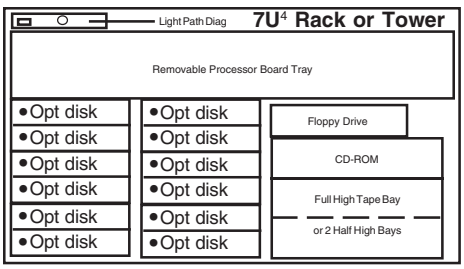
Options

1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	73P2865	IBM ServeRAID 6M U320 256MB Adapter	02R0988
2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	26K5709
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	26K5710
Active Memory 4-slot Expansion Card	13M7409	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	26K5711
Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	13N0694	Remote Supervisor Adapter II Slimline	59P2984
Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	13N0695	SAS 3.5" 6-drive Backplane	13M7864
775 watt Hot-Swap Power Supply (WW)	13M7415	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	26K5698
IBM ServeRAID™-8i SA-SCSI Adapter	13N2227	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	26K5699

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

Bay ① 3.5", SL 1", access, diskette
Bay ② 5.25", HH 1.6" access, CD-ROM
Bay ③ 5.25", HH 1.6" access, open*
Bay ④ 5.25", HH 1.6" access, open*
Bays 5 to 10 (six bays):
standard 3.5" SL 1" hot-swap disk bays
Bays 11 to 16 (six bays):
optional 3.5" SL 1" hot-swap disk bays



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

All models: Maximum internal disk capacity: 3.6TB with 12x 300GB[2] hot-swap SAS disks

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

See footnotes for important warranty information • = Hot-swap

(X260A) © IBM Corp. Aug 2005

IBM @server™ xSeries™ 305 (May 2003)

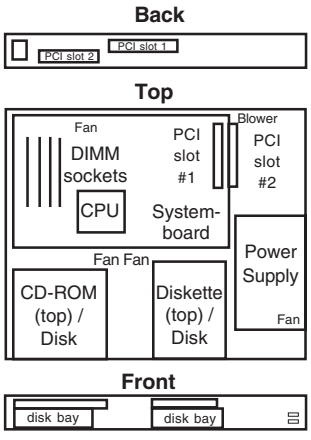
IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Disk bays	Mech-anical	Slots x bays	Ethernet	Limited warranty[3]	Available date
8673-72X	Pentium 4 2.8BGHz	512KB	533	256MB	ECC	40GB EIDE	ATA-100	2 fixed	1U rack	2x4	2 x Gigabit	1 year	May2003
8673-73X	Pentium 4 2.8BGHz	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 2.8BGHz**[1] with 533MHz frontside bus (FSB)
L2 cache	**512KB** / on die of processor / at processor speed (no L3 cache)
SMP support	No SMP support
Implementation	Systemboard contains one Intel mPGA478B socket (with Pentium 4 FC-PGA2 and heatsink), four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated chipset, two EIDE connectors, ethernet, and graphics
Memory	**256MB** std / 4GB max[13] / one slot used / three slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / memory bus runs at 2 x 133MHz / **Error Checking and Correcting (ECC)** memory controller
SCSI disk controller	*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	**EIA 19" Rack (1U[4])** / rack-mount only / supports 16.75" deep racks for telco and colocation implementations
Architecture / chipsets	**ServerWorks® Grand Champion™ SL** / CMIC-SL (Super Lite) Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB bus to Host Bridge for PCI-X Bus A with slots and PCI-X Bus B with dual ethernet) / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2-based graphics controller, EIDE, USB, LPC bus to Super I/O) / National Semiconductor® PC87414 Super I/O chip (serial, keyboard, mouse, diskette)
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom® BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / PXE / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM / diskette	24X-10X[6] CD-ROM / IDE; *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

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

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

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

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

US models announced May 13, 2003 or September 9, 2003

(X305B) © IBM Corp. September 2003

IBM @server™ xSeries™ 306

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

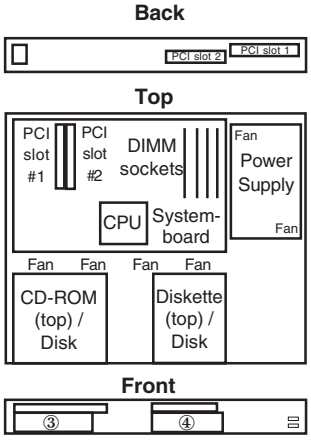
IBM® Machine Type	GAV	model	Processor	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr[3]	Available date
8836	1Mx	11X	Pentium 4® 2.8GHz	1MB	800	512MB	36.4GB SCSI	Ultra320	2 fixed	1U[4] rack	2x4	Dual Gb	1 yr	Apr 2004
8836	1Sx	15X	Pentium 4 2.8GHz	1MB	800	512MB	open bay	SATA	2 simple-swap	1U rack	2x4	Dual Gb	1 yr	Apr 2004
8836	2Mx	21X	Pentium 4 3.0GHz	1MB	800	512MB	36.4GB SCSI	Ultra320	2 fixed	1U rack	2x4	Dual Gb	1 yr	Apr 2004
8836	2Sx	25X	Pentium 4 3.0GHz	1MB	800	512MB	open bay	SATA	2 simple-swap	1U rack	2x4	Dual Gb	1 yr	Apr 2004
✂ 8836	3Mx	31X	Pentium 4 3.2GHz	1MB	800	512MB	36.4GB SCSI	Ultra320	2 fixed	1U rack	2x4	Dual Gb	1 yr	Jun 2004
✂ 8836	3Sx	35X	Pentium 4 3.2GHz	1MB	800	512MB	open bay	SATA	2 simple-swap	1U rack	2x4	Dual Gb	1 yr	Jun 2004

Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium 4 up to 3.2GHz**[1] with 800MHz frontside bus (FSB)
L2 cache	**1MB** / 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, riser for two PCI-X slots, and integrated chipset, one EIDE connector, two SATA connectors, ethernet, and graphics
Memory	**512MB** std / 4GB max[13] / one slot used / three slots available / **PC2700** 333MHz (1xx, 2xx) or **PC3200** 400Mhz (3xx) registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / memory bus runs at 2 x 166MHz / **Error Checking and Correcting (ECC)** memory controller / PC3200 memory supported in all models
SCSI disk controller	*SCSI models:* **Adaptec® chipset / single channel Wide Ultra320 SCSI** (LVD 320MB/sec) / on PCI adapter / one channel with up to 15 device support / Integrated Raid 7e (Raid 0-1)
SCSI connectors	*SCSI models:* On PCI adapter: one 68-pin SCSI connector
IDE disk controller	Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Cables	*SCSI models:* one 2-drop 16-bit LVD SCSI cable, 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 - features	*SCSI:* 36.4GB Ultra320 SCSI, 10K rpm, 4.7ms read seek, S.M.A.R.T.[5]; *SATA:* open bay;
Mechanical	**EIA 19" Rack (1U[4])** / 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 66MHz / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Intel Kenai II / two full gigabit ethernet MAC and PHY layer functions / on planar/ port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports
CD-ROM / diskette	24X-10X[6] 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 / two USB (Vers 2.0)
Front ports / graphics	*Front:* two USB (Vers 2.0); *Graphics:* SVGA / ATI® Radeon 7000 / on planar / 18MB DDR 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	On planar / monitors system and processor temperature, fan 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	Six fans (four fans for system, two on power supply) / variable speed / not redundant or hot-swap 300 watt
Power supply	/ universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, operating system

256MB PC2700 CL2.5 ECC DDR-SDRAM DIMM	06P4053
512MB PC2700 CL2.5 ECC DDR-SDRAM DIMM	06P4054
1GB PC2700 CL2.5 ECC DDR-SDRAM DIMM	06P4055
1GB PC3200 CL2.5 ECC DDR-SDRAM DIMM	06P4051
80GB SATA simple-swap HDD (7200 rpm)*	73P8002
160GB SATA simple-swap HDD (7200 rpm)*	73P8003
36.4GB 10K Ultra320 SCSI SL 68-pin HDD*	32P0723
73.4GB 10K Ultra320 SCSI SL 68-pin HDD*	32P0724
146.4GB 10K Ultra320 SCSI SL 68-pin HDD*	32P0725
Remote Supervisor Adapter II	59P2984
ServeRAID™-6i+ Ultra320 SCSI Adapter	13N2190
ServeRAID-7T SATA Controller	71P8648
IBM NetBAY25 Standard Rack	9306250
IBM NetBAY42 Enterprise Rack	930842S
IBM ACT Local Console Manager	1735L04

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

** Disk not supported in all x306 systems*



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

Bay ① 5.25", UltraSlim 0.5", access, std CD-ROM
Bay ② 3.5", UltraSlim 0.5", access, std diskette
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 20"; 43.7mm x 439.9mm x 508mm
- 26 to 28 lbs; 11.8kg to 12.7kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- SCSISelect near startup by pressing CTRL+A (SCSI models)
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

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

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information
US models announced March 16, 2004 (1xx, 2xx) and June 8, 2004 (3xx)
✂ = withdrawn product

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IBM @server™ xSeries™ 306 (August 04)

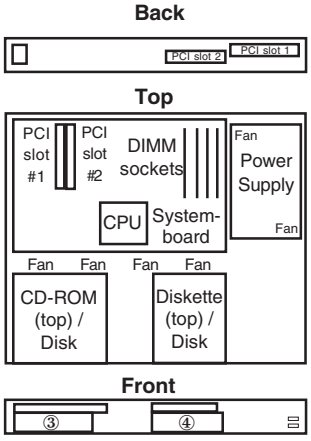
For GAV systems, lowercase "y" should be replaced with a country-specific code.

IBM® Machine Type	GAV model	Processor	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr[3]	Available date
8836	- 4My -41x	Pentium 4® 3.2GHz	1MB	800	512MB	36.4GB	SCSI Ultra320	2 fixed	1U[4] rack	2x4	Dual Gb	1 yr	Aug 2004
8836	- 4Sy -45x	Pentium 4 3.2GHz	1MB	800	512MB	open bay	SATA	2 simple-swap	1U rack	2x4	Dual Gb	1 yr	Aug 2004
☛ 8836	- 5My -51x	Pentium 4 3.4GHz	1MB	800	512MB	36.4GB	SCSI Ultra320	2 fixed	1U[4] rack	2x4	Dual Gb	1 yr	Jan 2005
☛ 8836	- 5Sy -55x	Pentium 4 3.4GHz	1MB	800	512MB	open bay	SATA	2 simple-swap	1U[4] rack	2x4	Dual Gb	1 yr	Jan 2005

Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium 4 at 3.2GHz[1] & 3.4GHz** with 800MHz FSB optimized for **Extended Memory 64 Technology(EM64T)**
L2 cache	**1MB** min and max / at processor speed / ECC
SMP support	No SMP support
Implementation	Systemboard contains one Intel PGA604 socket (with Pentium 4 FC-PGA2 and heatsink), four memory DIMM slots, two PCI-X slots, and integrated chipset, one EIDE connector, two SATA connectors, dual ethernet, and graphics
Memory	**512MB** std / 4GB max[13] / one slot used / three slots available / **PC3200** 400Mhz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / memory bus runs at 2 x 200MHz / **Error Checking and Correcting (ECC)** memory controller
SCSI disk controller	*SCSI models:* **Adaptec® 7901 chipset / single channel Wide Ultra320 SCSI** (LVD 320MB/sec) / on PCI adapter / one channel with up to 15 device support / Integrated Raid 7e (Raid 0-1) / 68 pin connector on PCI adapter
SATA disk controller	SATA-150 controller (150MB/sec) / on planar / one connector on systemboard / Integrated Raid 7e (Raid 0-1)
Cables	Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Disk - features	*SCSI models:* one 2-drop 16-bit LVD SCSI cable, 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) *SCSI:* 36.4GB Ultra320 SCSI, 10K rpm, 4.7ms read seek, S.M.A.R.T.[5]; *SATA:* open bay, simple swap
Mechanical	**EIA 19" Rack (1U[4])** / 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 66MHz / no hot-swap Active™ PCI slots / **half-length**
Ethernet controllers	**Dual Gigabit** 10/100/1000 ethernet ports / Intel Kenai II / 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® / Alert Standard Format 2.0 / Rear RJ-45 ports (2)
CD-ROM / diskette	24X-10X[6] CD-ROM Slim/ 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 / two USB (Vers 2.0)
Front ports / Graphics	*Front:* two USB (Vers 2.0) SVGA / ATI® Radeon™ 7000 / on planar / 16MB DDR SDRAM std/max
Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt	On planar / 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 pwr on/off via ASF 2.0
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	Six fans (four fans for system, two on power supply) / variable speed / not redundant or hot-swap 300 watt
Power supply	/ universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, operating system

256MB PC3200 CL3 ECC DDR-SDRAM DIMM	06P4049
512MB PC3200 CL3 ECC DDR-SDRAM DIMM	06P4050
1GB PC3200 CL3 ECC DDR-SDRAM DIMM	06P4051
80GB SATA simple-swap HDD (7200 rpm)	73P8002
160GB SATA simple-swap HDD (7200 rpm)	73P8003
250GB SATA simple-swap HDD (7200 rpm)	73P8006
36.4GB 10K Ultra320 SCSI SL 68-pin HDD	32P0723
73.4GB 10K Ultra320 SCSI SL 68-pin HDD	32P0724
146.4GB 10K Ultra320 SCSI SL 68-pin HDD	32P0725
36.4GB 15K Ultra320 SCSI SL 68-pin HDD	32P0784
73.4GB 15K Ultra320 SCSI SL 68-pin HDD	32P0785
Remote Supervisor Adapter II	59P2984
ServeRAID™-6i+ Ultra320 SCSI Adapter	13N2190
ServeRAID-7t SATA Controller	71P8648
IBM NetBAY25 Standard Rack	9306250

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



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

Bay ① 5.25", UltraSlim 0.5", access, std CD-ROM
Bay ② 3.5", UltraSlim 0.5", access, std diskette
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 20"; 43.7mm x 439.9mm x 508mm
- 26 to 28 lbs; 11.8kg to 12.7kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- SCSISelect near startup by pressing CTRL+A (SCSI models)
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

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

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information
☛ = Models announced January 18, 2005

(X306B) © IBM Corp. January 2005

IBM @server™ xSeries™ 306m

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

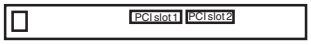
IBM® Machine Type	GAV model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mech-anical	Slots x bays	Ethernet	Ltd warr[3]	Available date
8849/8891	10y-10x	Pentium® 4 531 3.0GHz	1MB	800	512MB	SATA	2 simple-swap	1U[4] rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8891	1Ay-Ax	Pentium 4 531 3.0GHz	1MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8891	20y-20x	Pentium D 830 3.0GHz	2x1MB	800	1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8891	30y-30x	Pentium 4 640 3.2GHz	2MB	800	512MB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8891	3Ay-3Ax	Pentium 4 640 3.2GHz	2MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8891	40y-40x	Pentium 4 650 3.4GHz	2MB	800	512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	1/3yr	Oct 2005
8849/8891	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 / 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	**EIA 22" Rack (1U[4])** / 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-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 /	*Front:* two USB (Vers 2.0)
Graphics	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-7t SATA Integrated Controller	71P8648

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

Back



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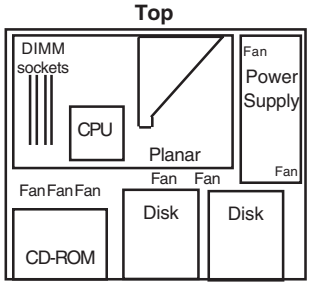

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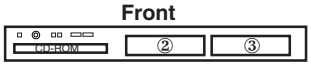

Some:
Slot 1: 3/4 length, full height, 64-bit 100MHz PCI X 1.0 (3.3v)
Slot 2: half length, low-profile, 64-bit 100MHz PCI X 1.0 (3.3v)
Some:
Slot 1: 3/4 length, full height, 64-bit 100MHz PCI X 1.0 (3.3v)
Slot 2: half length, low-profile, PCI-E x8

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

Maximum internal disk capacity[13] (model dependent):
600GB with two 300GB SAS disks or 500GB with two 250GB SATA disks

LIMITED WARRANTY[3]

- **1 year parts and labor standard 8849 MTM**
- **3 year parts and labor standard 8491 MTM**
- **International Warranty Service[3]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

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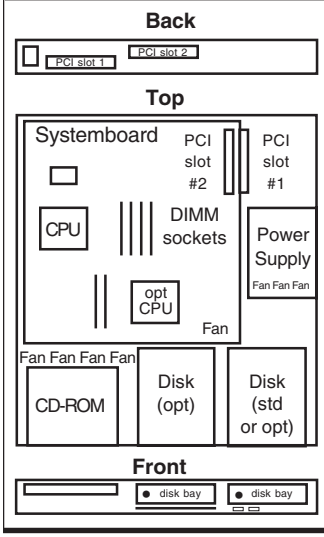
IBM @server™ 325 (8835)

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
✂ 8835-21X	1 x Opteron™ 240	1.4Ghz[1]	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	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	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	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	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	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	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	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	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	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	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**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	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
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 A
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported
Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / optional Remote Supervisor Adapter II card not supported
Diagnostics	Diagnositic LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported
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 inside power supply) / variable speed / not redundant or hot-swap
Power supply	411 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys.

Opteron 240 Processor Upgrade	24P8189
Opteron 242 Processor Upgrade	24P8190
Opteron 246 Processor Upgrade	13N0700
512MB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2266
1GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2267
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 x653.3mm
- 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity[13] (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **1 year IOR 9x5, 4 hr avg response** (ServicePac® part num 69P9399)
  - **2 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2119)
  - **2 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2120)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
  - **3 year IOR 9x5, NBD response** (ServicePac part num 69P9506)
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(X325A) © IBM Corp. August 2003

• = Hot-swap in some models

US models announced August 5, 2003

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

IBM @server™ 325 (8835) (January 2004)

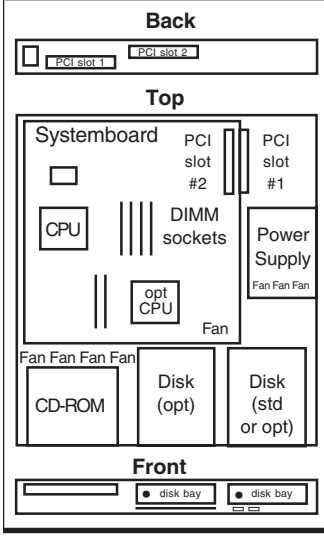
xREF by eServer Field Skills Enablement Team

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)	**Up to 2 x AMD® Opteron™ 248** 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	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	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	*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	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**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	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
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 A
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported
Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / Remote Supervisor Adapter II card not supported
Diagnostics	Diagnositic LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported
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 inside power supply) / variable speed / not redundant or hot-swap
Power supply	411 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys.

Opteron 248 Processor Upgrade	13N0701
Opteron 250 Processor Upgrade	13N0702
512MB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2266
1GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2267
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 x653.3mm
- 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity[13] (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **1 year IOR 9x5, 4 hr avg response** (ServicePac® part num 69P9399)
  - **2 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2119)
  - **2 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2120)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
  - **3 year IOR 9x5, NBD response** (ServicePac part num 69P9506)
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(X325B) © IBM Corp. January 2004

• = Hot-swap in some models

US models announced January 2004 (61X, 62X), and May 25, 2004 (71X, 72X)

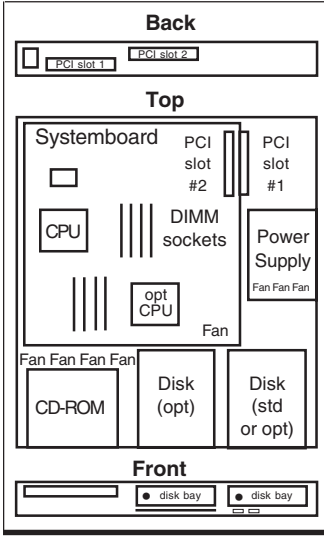
IBM @server™ 326 (8848) September 2004

IBM® Type-GAV	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
8848-51Y	1 x Opteron™ 246	2.0Ghz[1]	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Sept 2004
8848-52Y	1 x Opteron 246	2.0Ghz	1MB	1GB	Chipkill	80GB[2] SATA	SATA	2 fixed	2x3	2 x Gigabit	1 year	Sept 2004
8848-61Y	1 x Opteron 248	2.2Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Sept 2004
8848-62Y	1 x Opteron 248	2.2Ghz	1MB	1GB	Chipkill	80GB SATA	SATA	2 fixed	2x3	2 x Gigabit	1 year	Sept 2004
8848-71Y	1 x Opteron 250	2.4Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Sept 2004
8848-72Y	1 x Opteron 250	2.4Ghz	1MB	1GB	Chipkill	80GB SATA	SATA	2 fixed	2x3	2 x Gigabit	1 year	Sept 2004
☛ 8848-81Y	1 x Opteron 252	2.6Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Mar 2005
☛ 8848-82Y	1 x Opteron 252	2.6Ghz	1MB	1GB	Chipkill	80GB SATA	SATA	2 fixed	2x3	2 x Gigabit	1 year	Mar 2005

Processor(s)	**Up to 2 x AMD® Opteron™ 246, 248, 250, 252** with 800Mhz HyperTransport technology / 64-bit x86 Instruction set / 32-bit compatible
L2 cache	**1MB** / ECC / on die of processor / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, eight memory DIMM slots, two 64-bit 133/100Mhz PCI-X slots, integrated SATA or SCSI, ethernet, graphics / AMD Opteron HyperLink bus interface
Memory	**1GB** std / 16GB max[13] / four slots enabled with uni-processor, eight with dual / two slots used / six slots available / **PC2700** or **PC3200** registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Chipkill™** supported
SCSI disk controller	*All (not used on SATA models):* **LSI Logic® 53C1020 / Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
SATA controller/cable	*All:* SATA-150 controller / two connectors on planar / two 1-drop cables / 1 IDE
Disk - capacity	*SCSI models:* open; *SATA models:* 80GB / 7200 rpm / ATA-100 / 9.0ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled, supports 15k drives
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture/chipsets	**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, SATA, IDE, LPC to BIOS and Super I/O) / National Semiconductor® PC87366 Super I/O chip
Bus slots	(See detail below) two available PCI-X 1.0 / 1 full-length, 1 Half / 133MHz if using single adapter, 100MHz with 2 adaptors / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5704C / 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
Optical/diskette/kbd	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
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
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported
Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / Remote Supervisor Adapter II card not supported
Diagnostics	Diagnositic LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported
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 inside power supply) / variable speed / not redundant or hot-swap
Power supply	411 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys,

Opteron 246 Processor Upgrade	13N0705
Opteron 248 Processor Upgrade	13N0706
Opteron 250 Processor Upgrade	13N0702
Opteron 252 Processor Upgrade	13N0703
2GB PC2700 CL2.5 ECC DDR-SDRAM kit	73P2269
1GB PC3200 CL3 ECC DDR-SDRAM kit	73P3233
80GB SATA-150 7.2k HDD*	25R6902
160GB SATA-150 7.2k HDD*	25R6903
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 133/100MHz PCI X 1.0 (3.3v); Bus C
Slot 2: full-length, 64-bit 133/100MHz PCI X 1.0 (3.3v); Bus C

Bay 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 x653.3mm
- 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

Maximum internal disk capacity[13] (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
320GB with two 160GB EIDE disks

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **1 year IOR 9x5, 4 hr avg response** (ServicePac® part num 69P9399)
  - **2 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2119)
  - **2 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2120)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
  - **3 year IOR 9x5, NBD response** (ServicePac part num 69P9505)
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(e326A) © IBM Corp. February 2005

• = Hot-swap in some models

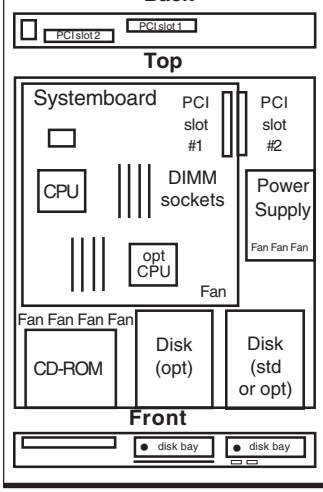
☛ = Models announced February 2005

IBM @server™ e326m (7969) October 2005

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

Positioning	**Entry 2-way rack server for compute-intesnsive applications and dual core computing at an attractive price**
Processor(s)	**Up to 2 x AMD® Opteron™ 280 Dual Core or 254 Single Core** / 800Mhz HyperTransport technology / Simultaneously supports 32-bit and 64-bit computing
L2 cache	**1MB** / per core / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, eight memory DIMM slots, integrated SATA or SCSI, ethernet, graphics, one PCI-E x8 and one 64-bit 133/100Mhz PCI-X (option to convert PCI-X slot to second PCI-E x8)
Memory	**1GB** std / 16GB max[13] / four slots enabled with uni-processor, eight with dual / two slots used / six slots available / **PC3200** registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Chipkill™** supported
SCSI disk controller	*All (not used on SATA models):* **LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
SATA controller/cable	*All:* SATA-150 controller / two connectors on planar / two 1-drop cables / 1 IDE
Disk - capacity	*SCSI models:* some: open some: 36GB; *SATA models:* 80GB / 7200 rpm / 9.0ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled, supports 15k drives
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture/chipsets	**ServerWorks HT2000 System I/O controller** connects to the processor sub-system via a 16x Hyper Transport Bus at 1GHz and provides PCI-E, PCI-X and Dual Gigabit Ethernet / **ServerWorks HT1000 South Bridge** interfaces system I/O to the HT2000 via a 8x Hyper Transport bus and provides PCI-X, SATA 2.0, USB 2.0, ATA 100 IDE, SMB, IOAPIC, Event Timer, Watchdog Timer, Interrupt controller and LPCI
Bus slots	(See detail below) one full-length PCI-X 1.0 and one half length PCI-E x8 / option to convert PCI-X slot to PCI-E x8 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5780 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / two rear RJ-45 ports
Optical/diskette/kbd	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
Front ports / graphics	*Front:* two USB (Vers 2.0); *Graphics:* SVGA / ATI® RN50b / on planar / 16MB SDRAM std/max / 1024x768x32bit@85Hz
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported
Systems mgmt	Standard MS-9549 QLogic system management / IPMI 1.5 compliant / connector on planar / Remote Supervisor Adapter II optional
Diagnostics	Diagnositic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported
Security	Power-on password / administrator password / Secure Power On/Off / unattended boot / selectable boot / unattended start mode / text console redirect via serial over LAN
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	Eight fans (five for system, three inside power supply) / Calibrated Vector Cooling™ / variable speed / not redundant / not hot-swap
Power supply	411 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), os

Opteron 252 Processor Upgrade	13N0703
Opteron 254 Processor Upgrade	13N0704
Opteron 265 Processor Upgrade	25R8961
Opteron 270 Processor Upgrade	25R8960
Opteron 275 Processor Upgrade	25R8959
Opteron 280 Processor Upgrade	25R8966
1GB PC3200 CL3 ECC DDR-SDRAM kit	73P3233
2GB PC3200 CL3 ECC DDR-SDRAM kit	73P3234
80GB SATA-150 7.2k HDD	25R6902
160GB SATA-150 7.2k HDD	25R6903
73GB 15K Ultra320 SCSI Hot-Swap HDD	90P1381
146GB 15K Ultra320 SCSI Hot-Swap HDD	90P1382
146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1306
300GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1307
IBM TotalStorage FC2-133 Host Bus Adapter	24P0960
IBM ServeRAID-6M SCSI (256MB Cache)	02R0988
USB Portable Diskette Drive	05K9276



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

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

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

Maximum internal disk capacity[13] (model dependent):
600GB with two 300GB SL SCSI disks or
320GB with two 160GB SATA disks

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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[14] toll-free support for warranty issues during the warranty period[3]**

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IBM @server™ xSeries™ 335 (8830) - February 2003

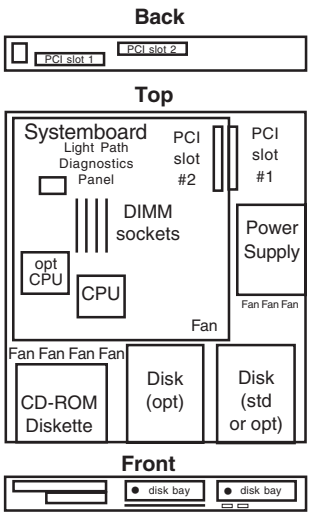
xREF by eServer Field Skills Enablement Team

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
✂ 8830-11X	1 x Xeon 2.8B GHz	512KB	533✍	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	1 year	May 2003
8830-12X	1 x Xeon 2.8B GHz	512KB	533✍	512MB	Chipkill	40GB[2] EIDE	EIDE	2 fixed	2x4	2 x Gigabit	1 year	May 2003
8830-21X	1 x Xeon 3.06 GHz	512KB	533✍	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	1 year	Apr 2003
8830-22X	1 x Xeon 3.06 GHz	512KB	533✍	512MB	Chipkill	40GB[2] EIDE	EIDE	2 fixed	2x4	2 x Gigabit	1 year	May 2003

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 2.8B or 3.06GHz**[1] 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	*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 / one 1-drop EIDE cable to CD-ROM
Disk - capacity	*SCSI models:* none standard / supports up to 15000 rpm disks; *EIDE models:* 40GB / 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 HD bays Ultra320-enabled**
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**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; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*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
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	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 / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys, one Cable Chain Technology (C2T) Kit per chain of servers or NetBAY ACT CAT-5 chaining solutions

Xeon 2.4GHz/512KB L2 Cache Proc Upg	59P5102
Xeon 2.8GHz/512KB L2 Cache Proc Upg	02R8958
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
80GB ATA-100 EIDE HDD*	09N4226
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
73.4GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD*	06P5756
Remote Supervisor Adapter	09N7585
xSeries Cable Chain Technology Cable Kit (2 meter breakout cable and2 meter KVM chaining cable)	06P4792
NetBAY ACT Local Console Manager	1735L04

** Disk not supported in all x335 systems*



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

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

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

Maximum internal disk capacity[13] (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

(X335B) © IBM Corp. April 2003

• = Hot-swap in some models

✂ US models withdrawn effective March 2004

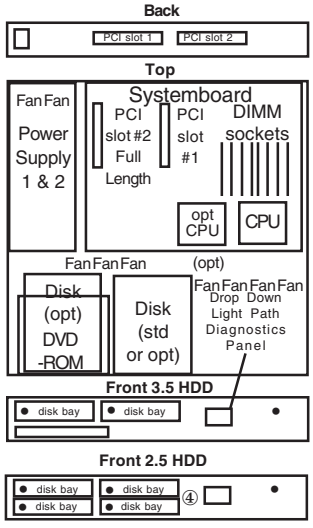
✍ 533Mhz FSB models may use 400Mhz FSB processors. 400Mhz FSB models may not use 533Mhz FSB processors.

IBM® Type-GAV-model	Qty x Processor	L2 cache	Memory	Memory type	Disk	Disk controller	Power Supply	Slots Disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
8837-01y-01x	1 x Xeon® 2.8GHz	1MB	512MB	std	None (open 3.5)	Ultra320	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Oct 2004
8837-02y-02x	1 x Xeon 2.8GHz	1MB	512MB	std	None (open 3.5)	SATA	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Oct 2004
8837-11y-11x	1 x Xeon 3.0GHz	1MB	1GB	std	None (open 3.5)	Ultra320	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Oct 2004
8837-41y-41x	1 x Xeon 3.6GHz	1MB	1GB	std	None (open 3.5)	Ultra320	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Oct 2004
8837-4Ay-4Ax	1 x Xeon 3.6GHz	1MB	1GB	std	None (open 2.5)	Ultra320	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Oct 2004
8837-42y-42x	1 x Xeon 3.6GHz	1MB	1GB	std	None (open 3.5)	SATA	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Oct 2004

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 2.8, 3.0, 3.2, 3.4, 3.6GHz** with 800MHz / **1MB** L2 Cache / **Extended Memory 64 Technology (EM64T)**
Cache	**1MB L2 cache** on all models / on die of processor / at processor speed / ECC
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 DIMM slots, two PCI-X slots (one full length 133MHz, one low-profile 100MHz) and integrated SCSI, dual GB ethernet, graphics
Memory	**512MB or 1GB** std / 16GB max[13] / 8 slots (6 avail) / **PC2-3200** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Active Memory(TM)**: online spare and memory mirror / abiltiy to support **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; optional on some 1GB (2x512) and greater DIMMS
SCSI disk controller	**LSI Logic® 53C1020 / Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / no external connector
SATA disk Controller	Enhanced SATA-150 (150MB/sec) controller / two connectors on planar / two one-drop cables
IDE controller / cable	one 1-drop EIDE cable to DVD-ROM
Disk - MAX capacity	***SCSI 3.5:*** 292GB with two 146GB HDD ***SCSI* 2.5**:four 2.5" 73GB HDD ***SATA:*** 500GB with two 250GB HDD
Disk - bays	***SCSI:*** two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors **SATA**: 2 simple-swap
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**Intel E7520** / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports
DVD-ROM / diskette	***Some***: DVD-ROM / IDE; *Diskette:* none
Rear ports	*Rear:* Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2
Graphics	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Systems mgmt	**IBM Baseboard Management Controller (BMC)** / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr req)
Diagnostics	**Drop down light path diagnostics** Pull out Front panel (LED lights indicate failing component)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	seven-nine fans / variable speed / hot-swap / redundant
Power supply	585 watt hot-swap (second Opt)/ universal / auto sensing / auto re-start
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys

Xeon 3.2GHz/1MB L2 Proc Upg	13N0663
Xeon 3.6GHz/1MB L2 Proc Upg	13N0665
512MB (2x256)PC2-3200 CL3 ECC DDR2 RDIMM	73P3523
1GB (2x512)PC2-3200 CL3 ECC DDR2 ChipKill	73P2865
2GB (2x1GB)PC2-3200 CL3 ECC DDR2 ChipKill	73P2866
80GB SATA 7.2K Simple Swap HDD	73P8002
160GB SATA 7.2K Simple Swap HDD	73P8003
73GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
36.4GB 10K Ultra320 SCSI Hot-Swap 2.5" HDD	32P0796
ServeRAID 6i+ adaptor	13N2190
Remote Supervisor Adapter II slimline	73P9341
Second 585W Power supply	90P5280
PCI-Express x8 full-length riser card	22R9293

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



Slot 1: low-profile, halfsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus A
Slot 2: fullsize, 64-bit 133MHz PCI X 1.0 (3.3v); Bus B

Bay ① 5.25", UltraSlim 0.5", access,std DVD-ROM (3.5 model)
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
Bay ④ 4 bays only available with 2.5" drive model and no DVD-ROM

- Stealth black color front bezel
- Cable Management Arm
- H 1.69" (1U) x W 17.32" x D 27"; 43mm x 440mm x686mm
- 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

LIMITED WARRANTY[3]

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

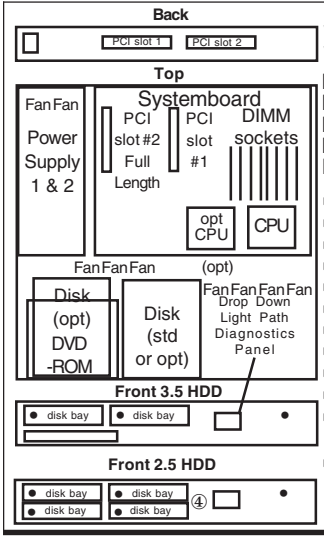
See footnotes for important warranty information
• = Hot-swap in some models

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

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 3.0, 3.2, 3.4, 3.6GHz** with 800MHz / **2MB** L2 Cache / **Extended Memory 64 Technology (EM64T)**
Cache	**2MB L2 cache** on all models / on die of processor / at processor speed / ECC
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 DIMM slots, two PCI-X slots (one full length 133MHz, one low-profile 100MHz) and integrated SCSI or SATA, dual GB ethernet, graphics
Memory	**1GB** std / 16GB max[13] / 8 slots (6 avail) / **PC2-3200** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Active Memory(TM)**: online spare and memory mirror / **Error Checking and Correcting (ECC)**
SCSI disk controller	**LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / no external connector
SATA disk Controller	Enhanced SATA-150 (150MB/sec) controller / two connectors on planar / two one-drop cables
IDE controller / cable	one 1-drop EIDE cable to DVD-ROM
Disk - MAX capacity	***SCSI 3.5:*** 292GB with two 146GB HDD ***SCSI* 2.5**:four 2.5" 73GB HDD ***SATA:*** 500GB with two 250GB HDD
Disk - bays	***SCSI:*** two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors **SATA**: 2 simple-swap
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**Intel E7520** / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports
DVD-ROM / diskette	***Some***: DVD-ROM / IDE; *Diskette:* none
Rear ports	*Rear:* Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2
Graphics	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Systems mgmt	**IBM Baseboard Management Controller (BMC)** / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr req)
Diagnostics	**Drop down light path diagnostics** Pull out Front panel (LED lights indicate failing component)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	seven-nine fans / variable speed / hot-swap / redundant
Power supply	585 watt hot-swap (second Opt)/ universal / auto sensing / auto re-start
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys

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

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



Slot 1: low-profile, halfsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus A
Slot 2: fullsize, 64-bit 133MHz PCI X 1.0 (3.3v); Bus B

Bay ① 5.25", UltraSlim 0.5", access,std DVD-ROM (3.5 model)
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
Bay ④ 4 bays only available with 2.5" drive model and no DVD-ROM

- Stealth black color front bezel
- Cable Management Arm
- H 1.69" (1U) x W 17.32" x D 27"; 43mm x 440mm x686mm
- 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

LIMITED WARRANTY[3]

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

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

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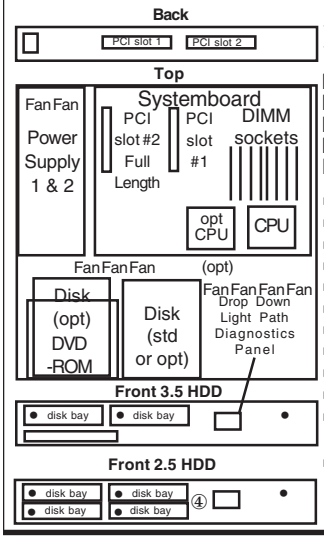
IBM @server™ xSeries™ 336 (8837) - November 2005

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
8837-05U-05x	1 x Xeon™2.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-0WU-0Wx	1 x Xeon 2.8GHz/SC	2MB	1GB	None(open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Sep 2005
8837-06U-06x	1 x Xeon 2.8GHz/SC	2MB	1GB	None(open 3.5)	SATA	DVD	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Sep 2005
8837-55U-55x	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-5VU-5Vx	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Sep 2005
8837-56U-56x	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 3.5)	SATA	DVD	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Sep 2005
8837-E4U-E4x	1 x Xeon 2.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-E5U-E5x	1 x Xeon 3.8GHz/SC	2MB	1GB	None(open 3.5)	Ultra320	DVD	2x585W	2 hot-swap	2x3	2 x Gigabit	3 year	Sep 2005
8837-D1U-D1x	1 x Xeon 2.8GHz/DC	2x2MB	2GB	None(open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Nov 2005
8837-DAU-DAx	1 x Xeon 2.8GHz/DC	2x2MB	2GB	None(open 2.5)	Ultra320	DVD	585W	4 hot-swap	2x3	2 x Gigabit	3 year	Nov 2005

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**Intel® Xeon Processor up to 3.8GHz Single Core 800MHz FSB / Xeon Processor 2.8GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)** / Hyper-Threading
Cache	**2MB L2 Cache** std on Single Core / **2x2MB L2 Cache** std on Dual Core / on die of processor / at processor speed / ECC
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, eight DIMM slots, two PCI-X slots (one full length 133MHz, one low-profile 100MHz) and integrated SCSI or SATA, dual GB ethernet, graphics
Memory	**1GB** std / 16GB max[13] / 8 slots (6 avail) / **PC2-3200** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Active Memory(TM)**: online spare and memory mirror / **Error Checking and Correcting (ECC)**
SCSI disk controller	**LSI Logic® 53C1020 / Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / no external connector
SATA disk Controller	Enhanced SATA-150 (150MB/sec) controller / two connectors on planar / two one-drop cables
IDE controller / cable	one 1-drop EIDE cable to DVD-ROM
Disk - MAX capacity	***SCSI 3.5:*** 292GB with two 146GB HDD ***SCSI* 2.5**:four 2.5" 73GB HDD ***SATA:*** 500GB with two 250GB HDD
Disk - bays	***SCSI:*** two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors **SATA**: 2 simple-swap
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**Intel E7520** / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports
DVD-ROM / diskette	***Some***: DVD-ROM / IDE; *Diskette:* none
Rear ports	*Rear:* Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2
Graphics	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Systems mgmt	**IBM Baseboard Management Controller (BMC)** / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr req)
Diagnostics	**Drop down light path diagnostics** Pull out Front panel (LED lights indicate failing component)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	**Calibrated Vectored Cooling™** / Std: seven fans; Max: nine / variable speed / hot-swap / redundant
Power supply	585 watt hot-swap (second Opt)/ universal / auto sensing / auto re-start
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys

Xeon 2.8GHz SC 2MB L2 Proc Upg	25R8907
Xeon 2.8GHz DC 4MB L2 Proc Upg	25R8930
Xeon 3.2GHz SC 2MB L2 Proc Upg	25R8905
Xeon 3.6GHz SC 2MB L2 Proc Upg	13N0667
Xeon 3.8GHz SC 2MB L2 Proc Upg	13N0670
512MB(2x256)PC2-3200 CL3 ECC DDR2 RDIMM	73P3523
1GB(2x512)PC2-3200 CL3 ECC DDR2 ChipKill	73P2865
2GB(2x1GB)PC2-3200 CL3 ECC DDR2 ChipKill	73P2866
80GB SATA 7.2K Simple Swap HDD	73P8002
160GB SATA 7.2K Simple Swap HDD	73P8003
73GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
36.4GB 10K Ultra320 SCSI Hot-Swap 2.5" HDD	32P0796
ServeRAID 6i+ adaptor	13N2190
Remote Supervisor Adapter II slimline	73P9341
Second 585W Power supply	90P5280
PCI-Express x8 full-length riser card	22R9293

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



Slot 1: low-profile, halfsize, 64-bit 100MHz PCI X 1.0 (3.3v); Bus A
Slot 2: fullsize, 64-bit 133MHz PCI X 1.0 (3.3v); Bus B

Bay ① 5.25", UltraSlim 0.5", access, std DVD-ROM (3.5 model)
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
Bay ④ 4 bays only available with 2.5" drive model and no DVD-ROM

- Stealth black color front bezel
- Cable Management Arm
- H 1.69" (1U) x W 17.32" x D 27"; 43mm x 440mm x686mm
- 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

LIMITED WARRANTY[3]

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

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

(X336C) © IBM Corp. November 2005

IBM @server™ xSeries™ 335 (DC power model)

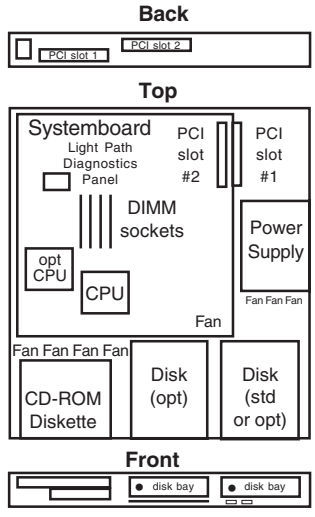
IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Hot -swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
8676-1AX	1 x Xeon 2.8B GHz	512KB	533	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	3 year	Mar 2003

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

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 2.8BGHz**[1] 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	*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 / one 1-drop EIDE cable to CD-ROM
Disk - capacity	*SCSI models:* none standard / supports up to 15000 rpm disks; *EIDE models:* 40GB / 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	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**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; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*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
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	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

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



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

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

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

Maximum internal disk capacity[13] (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

(X335DC-A) © IBM Corp. February 2003

• = Hot-swap

☞ US models announced February18, 2003

IBM @server™ xSeries™ 335 (DC power model) (January 2004)

xREF by eServer Field Skills Enablement Team

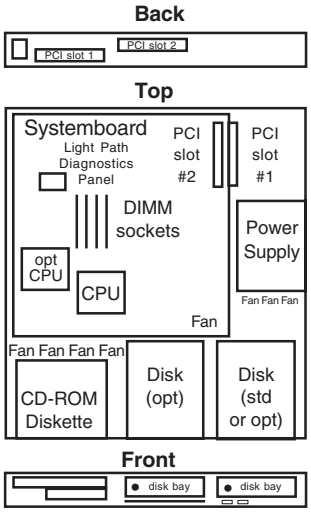
IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Hot -swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
8676-LAX	1 x Xeon 2.8B GHz	512KB	533	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	3 year	Jan 2004

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

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 2.8BGHz**[1] 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	*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 / one 1-drop EIDE cable to CD-ROM
Disk - capacity	*SCSI models:* none standard / supports up to 15000 rpm disks; *EIDE models:* 40GB / 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	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**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; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*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
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	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

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



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

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

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

Maximum internal disk capacity[13] (model dependent):
293.6GB with two 146.8GB SL SCSI disks or
240GB with two 120GB EIDE disks

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

• = Hot-swap

US models announced January 20, 2004

(X335DC-B) © IBM Corp. January 2004

IBM® Type-model	Qty x Processor	L2 cache	Memory	Ultra160 SCSI disk	SCSI controller	Mech-anical	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

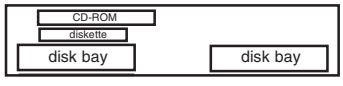
DC power models are designed for network infrastructures requiring network equipment to support DC power environments

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

512MB SDRAM ECC DIMM 133MHz RDIMM	33L3324
1GB SDRAM ECC DIMM 133MHz RDIMM	33L3326
36.4GB 10K Ultra160 SCSI SL HDD	06P5751
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

Slot 1: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B
Slot 2: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B
Slot 3: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B
Slot 4: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C
Slot 5: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C
Slot 6: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C



2U Rack

Bay ① 3.5", 0.5", access, std diskette
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 3.5" 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-compiant

All models: Max int disk capacity: 72.8GB[2] with two 36.4GB SL disks

LIMITED WARRANTY[3]

- **1 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **1 year on site warranty service upgrade options (in eligible locations):[7]**
  - **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)
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

IBM @server™ xSeries™ 343 (June 2004)

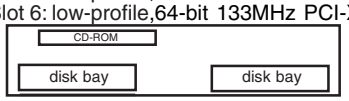
IBM® Type-model	Qty x Processor	L2 cache	Memory	Ultra320 SCSI disk	SCSI controller	Mechanical	Slots x bays	Disk Bays	Alarm Panel	Power supply	Compliant	Available date
✂ 8847-14X	2 x Pentium® Xeon 2.4GHz	512KB	1GB	1 x 73.4GB[2] 10K	2 x Ultra320	2U[4] rack	6x3	2 HS	Yes	DC power	NEBS-3	Jul 2004
8847-24X	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	*Network Equipment Building System (NEBS) level 3-compiant for telecommunications carrier-grade environments*
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	subsystems **2-way SMP** via second identical processor is standard
Memory	**Up to 2GB std / 12GB[13] 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 (2U[4]) x 20-inch deep**
Rack support	Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit
PCI bus slots	(See below) three full height full length 64-bit 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)
Power supply	*Std:* one (14X) or two (24X); *max:* two / accessible from rear **480 watt (-48 to -60 V dc [direct current])** / supports dual input sources (two power sources) / **redundant / hot-swap** / auto-restart support
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
Prerequisites	Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system

2GB PC2100 DDR ECC RDIMM Memory Kit 73P4126
Other options available via special Bid

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)

All models: Max int disk capacity: 293.6GB[2] with two 146.8GB SL disks

LIMITED WARRANTY[3]

- **3/3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(X343B) © IBM Corp. June 2004

US model announced June 15, 2004

✂ Model withdrawn from marketing effective April 2005

IBM @server™ xSeries™ 346 (August 2004)

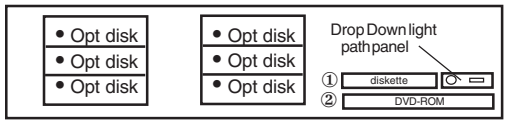
IBM® Type-GAV-model	Qty x Processor	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-01y-01U	1 x Xeon™ 2.8GHz	1MB	512MB	None	2 x Ultra320	2U[4]	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Aug 2004
8840-11y-11U	1 x Xeon 3.0GHz	1MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Aug 2004
8840-41y-41U	1 x Xeon 3.6GHz	1MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Aug 2004

Positioning	*A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*
Processor	**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	**1MB** L2 Cache / 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	**512MB or 1GB** 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® 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) / *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 Proccesor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O
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 reseverved connector for continuous power (no ext power reqd)
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
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
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack

Xeon 2.8GHz 800MHz/1MB L2 Proc Upg	13N0688
Xeon 3.0GHz 800MHz/1MB L2 Proc Upg	13N0681
Xeon 3.2GHz 800MHz/1MB L2 Proc Upg	13N0683
Xeon 3.4GHz 800MHz/1MB L2 Proc Upg	13N0684
Xeon 3.6GHz 800MHz/1MB L2 Proc Upg	13N0685
512MB(2x256)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3523
1GB(2x512)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3522
2GB(2x1GB)PC2-3200 CL3 ECC DDR2-SDRAM	73P2866
IBM ServeRAID-7k Adapter	71P8642
IBM Remote Supervisor Adapter II Slim	73P9341
73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1306
625W (N. America) Hot-Swap Power Supply	26K5097
NetBAY Local Console Manager	1735L04
NetBAY Remote Console Manager	1735R16

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

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



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

- 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 WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

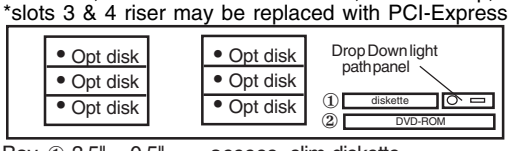
(X346A) © IBM Corp. August 2004

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	*A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*
Processor	**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	**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** 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® 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) / *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 Proccesor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O
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 reseverved connector for continuous power (no ext power reqd)
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
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
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack

Xeon 2.8GHz 800MHz/2MB L2 Proc Upg	25R8907
Xeon 3.0GHz 800MHz/2MB L2 Proc Upg	25R8902
Xeon 3.2GHz 800MHz/2MB L2 Proc Upg	25R8903
Xeon 3.4GHz 800MHz/2MB L2 Proc Upg	13N0686
Xeon 3.6GHz 800MHz/2MB L2 Proc Upg	13N0687
Xeon 3.8GHz 800MHz/2MB L2 Proc Upg	13N0689
512MB(2x256)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3523
1GB(2x512)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3522
2GB(2x1GB)PC2-3200 CL3 ECC DDR2-SDRAM	73P2866
IBM ServeRAID-7k Adapter	71P8642
IBM Remote Supervisor Adapter II Slim	73P9341
73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1306
625W (N. America) Hot-Swap Power Supply	26K5097
NetBAY Local Console Manager	1735L04
NetBAY Remote Console Manager	1735R16
Other options at **ibm.com**/pc/us/accessories	

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



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

- 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 WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

IBM @server™ xSeries™ 346 (October 2005)

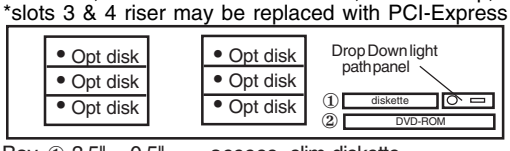
IBM® Type-GAV-model	Qty x Processor/Core	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-05y-05U	1 x Xeon™ 2.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U[4]	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-E3y-E3U	1 x Xeon 2.8GHz/SC	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

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® 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) / *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 Proccesor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O
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 reseverved connector for continuous power (no ext power reqd)
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
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
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack

Xeon 2.8GHz SC 800MHz/2MB L2 Proc Upg	25R8907
Xeon 2.8GHz DC 800MHz/4MB L2 Proc Upg	25R8930
Xeon 3.0GHz SC 800MHz/2MB L2 Proc Upg	25R8902
Xeon 3.2GHz SC 800MHz/2MB L2 Proc Upg	25R8903
Xeon 3.4GHz SC 800MHz/2MB L2 Proc Upg	13N0686
Xeon 3.6GHz SC 800MHz/2MB L2 Proc Upg	13N0687
Xeon 3.8GHz SC 800MHz/2MB L2 Proc Upg	13N0689
512MB(2x256)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3523
1GB(2x512)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3522
2GB(2x1GB)PC2-3200 CL3 ECC DDR2-SDRAM	73P2866
4GB(2x2GB)PC2-3200 CL3 ECC DDR2-SDRAM	73P4792
IBM ServeRAID-7k Adapter	71P8642
IBM Remote Supervisor Adapter II Slim	73P9341
73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1306
625W (N. America) Hot-Swap Power Supply	26K5097
NetBAY Local Console Manager	1735L04
NetBAY Remote Console Manager	1735R16

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

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



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

- 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 WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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IBM @server™ xSeries™ 360 (June 2003)

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 redun)	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

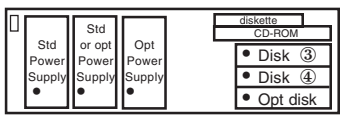
Processors	**1** or **2 x Intel® Xeon™ Processor MP 2.0, 2.5, or 2.8GHz**[1] with 400MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed
L3 cache	**1MB** or **2MB** / on die of processor / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	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

RXE-100 Remote Expansion Enclosure	86841RX
512MB PC1600 ECC DDR SDRAM RDIMM	33L3283
1GB PC1600 ECC DDR SDRAM RDIMM	33L3285
2GB PC1600 ECC DDR SDRAM RDIMM[12]	33L3287
Xeon MP 2.0GHz/1MB L3 Cache Proc Upg	73P8805
Xeon MP 2.5GHz/1MB L3 Cache Proc Upg	73P8806
Xeon MP 2.8GHz/2MB L3 Cache Proc Upg	73P8807
370 watt Hot-Swap Redundant Power Supply	31P6108
IBM ServeRAID™-4Mx Ultra160 SCSI Adapter	06P5736
IBM 73.4GB 10K Ultra160 SCSI Hot-Swap SL	06P5756
IBM NetBAY42 Standard Rack (SR)	9306420
IBM Integrated xSeries Adapter for iSeries	1519100
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1

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

Six available 3.3 volt Active PCI-X slots:

- Bus 2 (B) with two slots supports (slots 1, 2):
  - 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):
  - four fullsize, 64-bit, 66MHz PCI-X, hot-swap
  - or two fullsize, 64-bit, 66MHz PCI, hot-swap
  - or four fullsize, 64-bit, 33MHz PCI, hot-swap
- Bus 0 with one slot supports:
  - only for standard Remote Supervisor Adapter halfsize, 64-bit, 33MHz PCI, not hot-swap



3U Rack

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

- 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

All models: Maximum internal disk capacity: 220.2GB with three 73.4GB[2] hot-swap SCSI disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac® part num 96P2253)
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2254)
  - **4 year IOR 9x5, NBD response** (ServicePac part num 96P2255)
  - **5 year IOR 9x5, NBD response** (ServicePac part num 96P2259)
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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)

(X360E) © IBM Corp. November 2003

IBM® Type-model	Qty x Processor	L3 cache	Memory	DIMM slots	Disks	SCSI controller	Mechanical	Slots x bays	RXE Exp Ports	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8861-1RX	1 x Xeon™ MP 2.0GHz	1MB	1GB Chipkill™	8	None	Ultra320	3U[4] rack	6x8	One	One (not redun)	1	Dec 2003
8862-1RX	1 x Xeon MP 2.0GHz	1MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	One (not redun)	3	Dec 2003
✂ 8862-2RX	2 x Xeon MP 2.5GHz	1MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	Two redundant	3	Dec 2003
✂ 8862-3RX	2 x Xeon MP 2.8GHz	2MB	2GB Chipkill	16	None	Ultra320	3U rack	6x8	One	Two redundant	3	Dec 2003

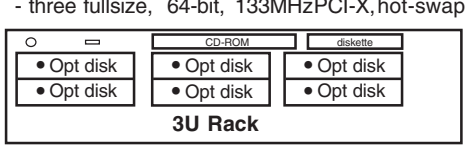
Processors	**1** or **2 x Intel® Xeon™ Processor MP 2.0, 2.5, or 2.8GHz**[1] with 400MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed
L3 cache	**1MB** or **2MB** / on die of processor / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI/PCI-X slots, and integrated SCSI, ethernet, graphics
Memory	Up to **2GB** std / 32GB max using high-capacity memory card / two (1GB model) or four (2GB models) 512MB DIMMs installed / one memory board standard with 8 or 16 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2100 200MHz registered 184-pin DDR-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ / With 16 DIMMs installed: **Memory ProteXion**™ (redundant bit steering) and **Active Memory**™ supporting **Memory Mirroring**™ (non-OS specific)
SCSI disk controller	LSI Logic® 53C1030 / Wide Ultra320 SCSI (LVD 320MB/sec) / dual channel / 64-bit 100MHz PCI-X / integrated on planar / Supports Raid 0/1
SCSI connectors	One internal and one external SCSI connector / internal controller wired to SCSI backplane
SCSI cabling	One standard 16-bit LVD cable can be reattached to optional ServeRAID adapter from six-bay backplane instead of motherboard
IDE controller / cabling	SCSI RAID adapter 68-pin connector on systemboard for this cable to get signals to six-bay backplane
Disk - capacity	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - bays	None standard / supports up to 15,000 rpm disks **Six** 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) / IBM PCI-X Host Bridges provide six peer PCI-X buses / PCI-X Bus 0 supports adapter slot with Remote Supervisor Adapter II (inc. graphics), and ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]) / PCI-X Bus 1 supports gigabit Ethernet, SCSI, and slot for optional ServeRAID adapter
Slots (Active™ PCI-X)	Six total PCI-X slots (one unavailable) / 5 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 dividersbv
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	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 100Mhz PCI-X / Wake on LAN® / Alert on LAN™ 2
Graphics controller	onboard graphics disabled / uses video on Remote Supervisor Adapter II
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 / one serial / no parallel ports / *Front:* one USB (Ver 1.1)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**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	None standard (because rack-based)
Power supplies	*Std:* one or two 950 watt hot-swap; *Max:* two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
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

512MB PC2100 ECC DDR SDRAM RDIMM	33L5038
1GB PC2100 ECC DDR SDRAM RDIMM	73P2031
2GB PC2100 ECC DDR SDRAM RDIMM[12]	33L5040
IBM x365Memory Upgrade Card	73P9710
Xeon MP 2.0GHz/1MB L3 Cache Proc Upg	73P7073
Xeon MP 2.5GHz/1MB L3 Cache Proc Upg	73P7074
Xeon MP 2.8GHz/2MB L3 Cache Proc Upg	73P7075
950 watt Hot-Swap Power Supply (WW)	73P7214
IBM ServeRAID™-4Mx Ultra160 SCSI Adapter	06P5736
IBM 73.4GB 15K Ultra320 SCSI Hot-Swap	32P0735
IBM Integrated xSeries Adapter for iSeries	1519100
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
RXE-100 Remote Expansion Enclosure	86841RX

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

Six available 3.3 volt PCI/PCI-X slots:

- Buses 0-5 supports slots 1 - 6:
  - one fullsize, 64-bit, 33MHz PCI, hot-swap Standard Remote Supervisor Adapter installed
  - one fullsize, 64-bit,100MHz PCI-X, hot-swap Optional ServeRAID adapter to install
  - one fullsize, 64-bit,133MHz PCI-X, hot-swap Optional iSeries IXA adapter to install
  - three fullsize, 64-bit, 133MHzPCI-X, hot-swap



3U Rack

Bay ①	3.5", 0.5",	access, std diskette
Bay ②	5.25", 0.5"	access, std CD-ROM
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
Bay ⑥	3.5", SL 1",	access, hot-swap, open
Bay ⑦	3.5", SL 1",	access, hot-swap, open
Bay ⑧	3.5", SL 1",	access, hot-swap, open

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

All models: Maximum internal disk capacity: 878.4GB with six 146.8GB[2] hot-swap SCSI disks

LIMITED WARRANTY[3]

- **1 or 3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 24x7, 4 hr avg response** (30L9186 (8861) / 96P2253 (8862))
  - **3 year IOR 24x7, 2 hr avg response** (31L2722 (8861) / 96P2254 (8862))
  - **4 year IOR 9x5, NBD response** (69P9210 (8661) / 96P2255 (8862))
  - **5 year IOR 9x5, NBD response** (69P9214 (8661) / 69P2259 (8862))
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information • = Hot-swap (X365A) © IBM Corp. December 2003
US models announced December 9, 2003 ✂ US models withdrawn effective May 28, 2004 (8662-2RX, 3RX)

IBM @server™ xSeries™ 365 (March 2004)

xREF by eServer Field Skills Enablement Team

IBM® Type-model	Qty x Processor	L3 cache	Memory	DIMM slots	Disks	SCSI controller	Mechan-ical	Slots x bays	RXE Exp Ports	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8861-4RX	1 x Xeon™ MP 2.2GHz	2MB	1GB Chipkill™	8	None	Ultra320	3U[4] rack	6x8	One	One (not redun)	1	Mar 2004
8862-4RX	1 x Xeon MP 2.2GHz	2MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	One (not redun)	3	Mar 2004
8862-5RX	2 x Xeon MP 2.7GHz	2MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	Two redundant	3	Mar 2004
8862-6RX	2 x Xeon MP 3.0GHz	4MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	Two redundant	3	Mar 2004

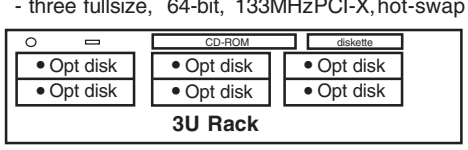
Processors	**1** or **2 x Intel® Xeon™ Processor MP 2.2, 2.7, or 3.0GHz**[1] with 400MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed
L3 cache	**2MB** or **4MB** / on die of processor / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI/PCI-X slots, and integrated SCSI, ethernet, graphics
Memory	Up to **2GB** std / 32GB max using high-capacity memory card / two (1GB model) or four (2GB models) 512MB DIMMs installed / one memory board standard with 8 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2100 200MHz registered 184-pin DDR-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / With 16 DIMMs installed: **Memory ProteXion™** (redundant bit steering) and **Active Memory™** supporting **Memory Mirroring™** (non-OS specific)
SCSI disk controller	LSI Logic® 53C1030 / Wide Ultra320 SCSI (LVD 320MB/sec) / dual channel / 64-bit 100MHz PCI-X / integrated Raid 0/1
SCSI connectors	One internal and one external SCSI connector / internal controller wired to SCSI backplane
SCSI cabling	One standard 16-bit LVD cable can be reattached to optional ServeRAID adapter from six-bay backplane instead of motherboard SCSI RAID adapter 68-pin connector on systemboard for this cable to get signals to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	None standard / supports up to 15,000 rpm disks
Disk - bays	**Six** 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) / IBM PCI-X Host Bridges provide six peer PCI-X buses / PCI-X Bus 0 supports adapter slot with Remote Supervisor Adapter II (inc. graphics), and ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]) / PCI-X Bus 1 supports gigabit Ethernet, SCSI, and slot for optional ServeRAID adapter
Slots (Active™ PCI-X)	Six total PCI-X slots (one unavailable) / 5 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 dividersbv
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	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 100Mhz PCI-X / Wake on LAN® / Alert on LAN™ 2
Graphics controller	onboard graphics disabled / uses video on Remote Supervisor Adapter II
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 / one serial / one parallel ports / *Front:* one USB (Ver 1.1)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**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	None standard (because rack-based)
Power supplies	*Std:* one or two 950 watt hot-swap; *Max:* two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
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

512MB PC2100 ECC DDR SDRAM RDIMM	33L5038
1GB PC2100 ECC DDR SDRAM RDIMM	73P2031
2GB PC2100 ECC DDR SDRAM RDIMM[12]	73P2030
IBM x365 Memory Upgrade Card	73P9710
Xeon MP 2.2GHz/2MB L3 Cache Proc Upg	13N0712
Xeon MP 2.7GHz/2MB L3 Cache Proc Upg	13N0711
Xeon MP 3.0GHz/4MB L3 Cache Proc Upg	13N0710
950 watt Hot-Swap Power Supply (WW)	73P7214
IBM ServeRAID™-6M Ultra320 SCSI Adapter	32P0033
IBM 73.4GB 15K Ultra320 SCSI Hot-Swap	32P0735
IBM Integrated xSeries Adapter for iSeries	1519100
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
RXE-100 Remote Expansion Enclosure	86841RX

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

Six available 3.3 volt PCI/PCI-X slots:

- Buses 0-5 supports slots 1 - 6:
  - one fullsize, 64-bit, 33MHz PCI, hot-swap
    Standard Remote Supervisor Adapter installed
  - one fullsize, 64-bit,100MHz PCI-X, hot-swap
    Optional ServeRAID adapter to install
  - one fullsize, 64-bit,133MHz PCI-X, hot-swap
    Optional iSeries IXA adapter to install
  - three fullsize, 64-bit, 133MHzPCI-X, hot-swap



3U Rack

Bay ① 3.5", 0.5", access, std diskette
Bay ② 5.25", 0.5" access, std CD-ROM
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
Bay ⑥ 3.5", SL 1", access, hot-swap, open
Bay ⑦ 3.5", SL 1", access, hot-swap, open
Bay ⑧ 3.5", SL 1", access, hot-swap, open

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

All models: Maximum internal disk capacity: 878.4GB with six 146.8GB[2] hot-swap SCSI disks

LIMITED WARRANTY[3]

- **1 or 3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 24x7, 4 hr avg response** (30L9186 (8861) / 96P2253 (8862))
  - **3 year IOR 24x7, 2 hr avg response** (31L2722 (8861) / 96P2254 (8862))
  - **4 year IOR 9x5, NBD response** (69P9210 (8661) / 96P2255 (8862))
  - **5 year IOR 9x5, NBD response** (69P9214 (8661) / 69P2259 (8862))
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information • = Hot-swap

US models announced March 2, 2004 (8661-4RX, 8662-4RX, 5RX, 6RX)

(X365B) © IBM Corp. March 2004

IBM @server™ xSeries™ 366 (November 2005)

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

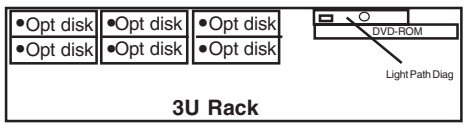
Processors	**Up to two 64-bit Intel® Xeon™ Processor MP up to 3.66GHz[1] 667MHz FSB Single Core / one 64-bit Intel Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading
L2 cache	**1 or 2 MB** / per core / at processor speed / **XceL4v**™ Dynamic Server Cache
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size) / Dual Core Capable
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, and integrated SCSI, ethernet, graphics
Active Memory™	Up to **4GB** std / 64GB max using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ / With 16 DIMMs installed: **Memory ProteXion**™ (redundant bit steering) and **Memory Mirroring**™ and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™
SCSI disk controller	*ALL*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 *E1X*: ServeRaid 8i
SCSI connectors	Controller wired to SAS backplane
SCSI cabling	One standard SAS cable attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	*E1x*: 3 x 36.4GB-10k / supports up to 73GB 10K rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette	8X[6] Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / *Front:* USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**Remote Supervisor Adapter II** Slimline (option) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* one or two 1300 watt hot-swap; *Max:* two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	13M7409
Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	13N0694
Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	13N0695
Xeon MP 7020 2.67GHz/2x1MB L2 Cache Proc Upg	25R8941
Xeon MP 7040 3.0GHz/2x2MB L2 Cache Proc Upg	25R8942
1300 watt Hot-Swap Power Supply (WW)	13M7413
IBM ServeRAID™-8i SAS-SCSI Adapter	13N2227
IBM ServeRAID 6M U320 256MB Adapter	02R0988
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	26K5654
IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	26K5655
IBM Remote Supervisor Adapter II Slimline	73P9341
Dual Core X3 upgrade kit (available 12/05)	39Y6580

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

Six available 3.3 volt PCI-X 2.0 slots:

Slot 1 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 2 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 3 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 4 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 5 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 6 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
*exclusive slot available for ServeRAID 8i adapter



3U Rack

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

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

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

All models: Maximum internal disk capacity: 440.4GB with six 73.4GB[2] hot-swap SAS disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

IBM® Type-model	Qty x Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mech-anical	Slots x bays	SMP/RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8870-11X	2 x Xeon™ MP 2.0GHz	1MB	64MB	2GB Chipkill™	None	2xUltra320	4U[4] rack	6x4	3/1	Two redundant	PCI	May 2004
8870-12X	2 x Xeon MP 2.2GHz	2MB	64MB	2GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-22X	2 x Xeon MP 2.7GHz	2MB	64MB	2GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-42X	4 x Xeon MP 3.0GHz	4MB	64MB	2GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-3EX	2 x Xeon DP 3.0GHz	N/A	64MB	2GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-4EX	4 x Xeon DP 3.0GHz	N/A	64MB	2GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004

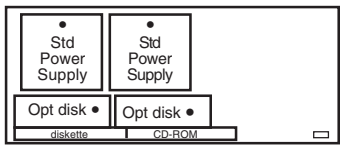
Positioning	*Up to 8-way (16-way two chassis) power for high-end databases, server consolidation and mission-critical business applications*
Processors	**2 or 4 Intel® Xeon™ Processor DP or MP 2.0Ghz - 3.0GHz**[1] with 400MHz frontside bus / supports Hyper-Threading
L3 cache	**Up to 4MB** each processor (Xeon MP models only) / on die of processor / at processor speed
L4 cache	**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
Processor upgrade	**4-way SMP** (up to **8-way SMP** with optional SMP Expansion Module, for Xeon MP models only)
SMP Expansion Module	**One SMP Expanion Module std** / two max, for Xeon MP models only / each contains four Intel 603-pin micro-PGA ZIF sockets for Xeon, 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)
Additional boards	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)
Memory	**2GB** std / **32GB** max[13] (up to **64GB** per chassis using optional SMP Expansion Module) / four 512MB DIMMs installed / 16 DIMM gold-connector slots / must install two indentical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / **Error Checking and Correcting (ECC)** and **Chipkill™** via **Memory ProteXion™** (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / **Active Memory™** supporting **hot-swap** and **hot-add** (OS specific) and **Memory Mirroring™** (non-OS specific)
SCSI disk controller	LSI Logic / Wide Ultra320 SCSI (LVD 32MB/sec) / dual channel / 64-bit 66MHz PCI / **integrated RAID-1** on I/O Board
SCSI implementation	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
IDE controller	Enhanced IDE ATA-100 controller in South Bridge / one one-drop IDE cable to backplane for diskette and CD-ROM
Disk - capacity/bays	No disks standard / supports up to 15K rpm SCSI disks / two hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (4U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**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
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 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.
CD-ROM / diskette	24X-8X[6] **DVD-ROM** / 3.5" 1.44MB diskette drive / both removable from Ultrabay 2000 bays / supports CD-RW, DVD
Ethernet	**Dual** Broadcom[a] 5704 10/100/1000 ethernet controller / on I/O Board / full duplex / 64-bit 66MHz PCI bus / Wake on LAN®
Graphics controller	SVGA / ATI® 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	None standard (because rack-based)
Power supplies	*Std:* two; *max:* two / hot-swap / 1050 watts at 220v or 550 watts at 110v / redundant at 220v with two power supplies / front access / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA
Cooling fans	Four hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

xSeries SMP Expansion Module	02R1870
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™-6M Ultra320 SCSI Adapter	32P0033
IBM Remote Supervisor Adapter II-EXA	13N0382
NetBAY11 Standard Rack Cabinet	9306110
8X/4X/24X Max CD-RW Ultrabay 2000	22P9101
IBM T540 15" Flat Panel Color Monitor (black)	9511AG4

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



4U Rack

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 146.8GB[2] hot-swap SCSI disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 9 hr x 5 day coverage, next day response time[7]**
- **3 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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information • = Hot-swap
US models announced March 2, 2004 and May 11, 2004 (11X)

(X445C) © IBM Corp. March 2004

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	Mech-anical	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

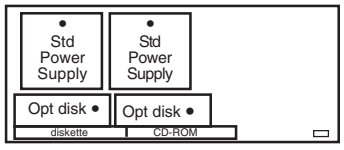
Positioning	*Up to 8-way (16-way two chassis) power for high-end databases, server consolidation and mission-critical business applications*
Processors	**2 x Intel® Xeon™ Processor MP 2.2, 2.7, or 3.0GHz**[1] with 400MHz frontside bus / supports Hyper-Threading
L3 cache	**2MB or 4MB** each processor / on die of processor / at processor speed
L4 cache	**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
Processor upgrade	SMP Expansion Module standard / ready for adding additional processors (up to 8 total) and memory
SMP Expansion Module	**One SMP Expanion 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)
Additional boards	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)
Memory	**0GB** std / **64GB** max[13] (uses standard SMP Expansion Module) / no DIMMs installed / 32 DIMM gold-connector slots / must install two indentical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / **Error Checking and Correcting (ECC)** and **Chipkill™** via **Memory ProteXion™** (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / **Active Memory™** supporting **hot-swap** and **hot-add** (OS specific) and **Memory Mirroring™** (non-OS specific)
SCSI disk controller	LSI Logic / Wide Ultra320 SCSI (LVD 32MB/sec) / dual channel / 64-bit 66MHz PCI / **integrated RAID-1** on I/O Board
SCSI implementation	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
IDE controller	Enhanced IDE ATA-100 controller in South Bridge / one one-drop IDE cable to backplane for diskette and CD-ROM
Disk - capacity/bays	No disks standard / supports up to 15K rpm SCSI disks / two hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (4U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**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
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 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.
CD-ROM / diskette	24X-8X[6] **DVD-ROM** / 3.5" 1.44MB diskette drive / both removable from Ultrabay 2000 bays / supports CD-RW, DVD
Ethernet	**Dual** Broadcom® 5704 10/100/1000 ethernet controller / on I/O Board / full duplex / 64-bit 66MHz PCI bus / Wake on LAN®
Graphics controller	SVGA / ATI® 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	None standard (because rack-based)
Power supplies	*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	Four hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

IBM Preload Kit for 1-8 Processors Microsoft Windows Server Datacenter 2003	48166BU
IBM Software Subscription Update for Microsoft Windows Server Datacenter 2003	4816DBX
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



4U Rack

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 146.8GB[2] hot-swap SCSI disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 9 hr x 5 day coverage, next day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information
US models announced March 2, 2004 • = Hot-swap

(X445D8B) © IBM Corp. March 2004

= Memory, HDDs and Preload Kit for Microsoft Windows 2000 or 2003 Datacenter Edition must be ordered as part of the IBM Datacenter Solution for these models.

IBM @server™ xSeries™ 455 (November, 2004)

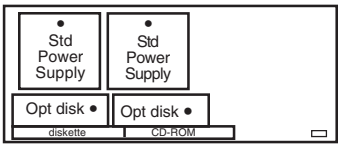
IBM® Type-model	Qty x Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mech-anical	Slots x bays	SMP/RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8855-4BY	4 x Itanium 2™ 1.5Ghz	4MB	64MB	2GB Chipkill™	None	2 x Ultra320	4U[4] rack	6x2	0/1	Two redundant	PCI	Dec 2004
8855-5BY	4 x Itanium 2 1.6Ghz	6MB	64MB	2GB Chipkill	None	2 x Ultra320	4U rack	6x2	0/1	Two redundant	PCI	Dec 2004
8855-6BY	4 x Itanium 2 1.6GHz	9MB	64MB	2GB Chipkill	None	2 x Ultra320	4U rack	6x2	0/1	Two redundant	PCI	Dec 2004

Positioning	*Up to 16-way power for high-end databases, server consolidation and mission-critical business applications*
Processors	**4 x Intel® Itanium 2™ Processor 1.5GHz or1.6GHz** with 400MHz frontside bus
L2 cache	**256KB** each processor / on die of processor / at processor speed
L3 cache	**4MB, 6MB** or **9MB** each processor / on die of processor / at processor speed
L4 cache	**64MB XceL4™ Server Accelerator Cache** ECC / 64-bit 400MHz bus from Cache and Scalability Controller
Processor upgrade	**4-way SMP** per chassis
SMP Exp. Module	**Up to 16-way** using four x455 chassis / requires appropriate 8-way or 16-way kits
Additional boards	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)
Memory	**2GB** std (using 2 x 1GB DIMMs)/ **56GB** max when installing 2GB DIMMs into 28 slots / 28 DIMM gold-connector slots **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way interleaving / **Active Memory™** with **Error Checking and Correcting (ECC), Chipkill™**, **Memory ProteXion™** (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / via memory mirroring (memory mirroring supported with any OS) / **Hot-add and Hot-swappable** using Microsoft Windows Server 2003
SCSI disk controller	LSI® 53C1030 / Ultra320 SCSI (LVD 320MB/sec) / dual channel RAID / 64-bit 66MHz PCI / integrated on I/O Board
SCSI implementation	Two channel backplane for internal hot-swap disks (16-bit LVD cable to SCSI backplane) / ServeRAID adapter and SCSI cable required if attaching external storage enclosures
IDE controller	Enhanced IDE ATA-100 controller in South Bridge / one one-drop IDE cable to backplane for diskette and CD-ROM
Disk - capacity/bays	No disks standard / supports up to 15K rpm SCSI disks / two hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (4U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64™ chipset** / IBM Cache and Scalability Controller with L4 cache controller / 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
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 RXE-100 Remote Expansion Enclosure can be shared between two x455 4-way, 8-way, or 16-way xSeries 455 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.
CD-ROM / diskette	24X/10X/24X/8X[6] CD-RW/DVD-ROM Combo IV drive standard / two removable Ultrabay™ 2000 bays
Ethernet	Dual Broadcom® 5704 10/100/1000 ethernet controller / on I/O Board / full duplex / 64-bit 66MHz PCI bus / Wake on LAN®
Graphics controller	SVGA / ATI® Rage XL / on I/O Board / 8MB SDRAM 125MHz std/max / up to 1280x1024 at 64K colors at 85Hz
Ports	*Rear:* RXE-100 Expansion Port (to connect optional RXE-100), RXE Management Port, two USB (Vers 1.1), analog DB-15 graphics, ethernet / no serial or parallel ports / *no keyboard or mouse / Front:* one USB (Vers 1.1)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems mgmt	**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) / USB only
Power supplies	*Std:* two; *max:* two / hot-swap / 1050 watts at 220v or 550 watts at 110v / redundant at 220v with two power supplies / front access / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA
Cooling fans	Four hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA

Itanium 2 1.3GHz/3MB L3 Cache Proc Upg	73P7076
Itanium 2 1.4GHz/4MB L3 Cache Proc Upg	73P7077
Itanium 2 1.5GHz/6MB L3 Cache Proc Upg	73P7078
512MB PC2100 CL2.5 ECC DDR SDRAM	33L5038
1GB PC2100 CL2.5 ECC DDR SDRAM	33L5039
2GB PC2100 CL2.5 ECC DDR SDRAM	33L5040
IBM 73.4GB 15K Ultra320 SCSI Hot-Swap	32P0735
IBM 146.8GB 10K Ultra320 SCSI Hot-Swap	32P0728
IBM ServeRAID™ 6M Ultra320 256MB Cache	02R0988
IBM RXE-100 Remote Storage Enclosure	86841RX
4-way to 8-way Expansion Option	73P9911
8-way to 16-way Supplemental Option	73P9715

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



4U Rack

Bay① 3.5", 0.5", access, open (Ultrabay 2000)
Bay② 3.5", 0.5", access, Combo (Ultrabay 2000)
Bay③ 3.5", SL 1", access, hot-swap
Bay④ 3.5", SL 1", access, hot-swap

- Dimensions: H6.9" x W17.3" x D28.1"
  Dimensions: H175mm x W440mm x D713mm
- Max weight: 120 lbs; 54.30kg
- 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 146.8GB[2] hot-swap SCSI disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **IBM On Site (IOR), 9-5 Next-Business-Day coverage[7]**
- **3 year on site warranty service upgrade option (in eligible locations):[7]**
  - **24 hr x 7 day coverage, 2 hour response time 96P2689**
- **Post warranty maintenance services available**
- **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information
• = Hot-swap

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IBM @server™ xSeries™ 460 (November 2005)

xREF by eServer Field Skills and Education Team

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

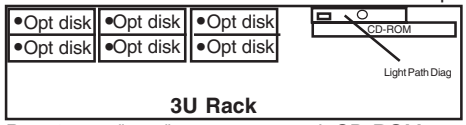
Processors	**Two 64-bit Intel® Xeon™ Processor MP up to 3.33GHz**[1] **667MHz FSB Single Core** / **Two 64-bit Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core** / **NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading technology
L2 cache	**1 or 2MB** / per core / **XceL4v™** Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache	**4 or 8MB** / integrated / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors (same speed/cache/core) per chassis / Dual Core Capable / up to **32-way** (eight chassis interconnected)
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, and integrated Serial Attached SCSI, ethernet, graphics
Active Memory™	**2GB** std / 64GB max per chassis using high-capacity memory card / 512GB max (eight chassis interconnect) / two memory cards standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™
SCSI disk controller	*ALL*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / ServeRaid 8i optional with dedicated slot
SCSI connectors	Controller wired to SAS backplane
SCSI cabling	One standard SAS cable attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	*None* / supports up to 73GB 10,000 rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER) / connect eight chassis (x460 or MXE-460) to achieve 32-way in 24U
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / Support for external scalability and memory control / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette	8X[6] Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet per chassis / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000M / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* Three Scalability ports, RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / *Front:* One USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**Remote Supervisor Adapter II slimline** / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director)
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* Two 1300 watt hot-swap; *Max:* two hot-swap / fully redundant with two power supplies /worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	13M7409
Xeon MP 2.83GHz/1MB L2 4MB L3 Proc Upg	13N0715
Xeon MP 3.00GHz/1MB L2 8MB L3 Proc Upg	13N0714
Xeon MP 7020 2.67GHz/2x1MB L2 4MB L3Proc Upg	25R8941
Xeon MP 7040 3.0GHz/2x2MB L2 8MB L3 Proc Upg	25R8942
Xeon MP 3.33GHz/1MB L2 8MB L3 Proc Upg	13N0713
IBM ServeRAID™-8i SAS-SCSI Adapter	13N2227
IBM ServeRAID 6M U320 256MB Adapter	02R0988
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	26K5654
IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	26K5655
XpandOnDemand™ Scalability Cable - 2.3M	13M7414
XpandOnDemand™ Scalability Cable - 2.9M	13M7416
MXE-460 Modular Expansion Enclosure	8874-1RY
Dual Core X3 upgrade kit (available 12/05)	39Y6580
Other options at **ibm.com**/pc/us/accessories	

8W = 2 x XpandOnDemand Scalabilty kits 2.3m
16W = 6 x XpandOnDemand Scalabilty kits 2.3m
32W = 8 x XpandOnDemand Scalabilty kits 2.3m + 4 x2.9m

Six available 3.3 volt PCI-X 2.0 slots:

Slot 1 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 2 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 3 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 4 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 5 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 6 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
*exclusive slot available for ServeRAID 8i adapter



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: 1,262 Btu/hr (370 watts)
Full Configuration: 4,094 Btu/hr (1200 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 73.4GB[2] hot-swap SAS disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service**[3]
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
- **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**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

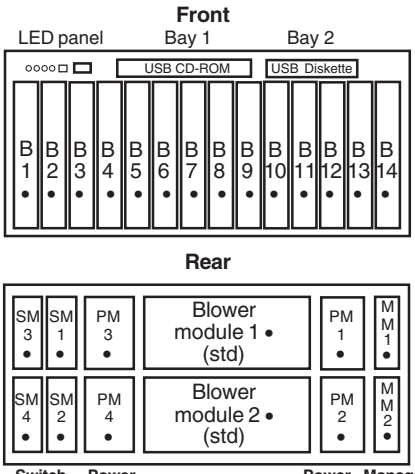
See footnotes for important warranty information • = Hot-swap

(X460A) © IBM Corp. Nov 2005

IBM® Type-model	Supported blades	Blade bays std / max	Switch module bays std / max	Switch module bays (type)	Management module bays std / max	Power module bays std / max	Power Module Wattage	Blower module bays std / max	Mech-anical	Available date
✂ 8677-1XX	8678 / 8832 HS20	0 / 14	0 / 4	Ethernet, Fibre Channel	1 / 1	2 / 4	1200W	2 / 2	7U[4] rack	Nov 2002
8677-2XX	All: HS20 / HS40*	0 / 14	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	1800W	2 / 2	7U[4] rack	Oct 2003
8677-3XX	All: HS20 / HS40	0 / 14	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	2000W	2 / 2	7U[4] rack	Oct 2004

Positioning	*Flexible, innovative design provides investment protection and reduces deployment costs*
Description	Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (diskette drive, optical drive, and ports for USB, keyboard, video, mouse)
Blade bays	Supports all blades HS20/HS40 and SCSI Storage Expansion Units / 14 hot-pluggable bays / front access
Switch modules	*Std:* none; *max:* four / hot-swap / rear access
Ethernet Switch Module	Supports two *4-port GB Ethernet Switch Modules* in bays 1 and 2 / one Ethernet Switch Module required for ethernet support on HS20 blade server (two modules to support both ethernet controllers on HS20 and for failover redundancy) / bays 1 and 2 wired to the HS20 dual integrated ethernet controllers / four external ports / connects to std mgmt module
Fibre Channel Switch Module	Supports two *2-port Fibre Channel Switch Modules* in bays 3 and 4 / one Fibre Channel Switch Module required for one of two ports on optional Fibre Channel Expansion Card (two modules to support both ports and for failover redundancy) / bays 3 and 4 wired to the HS20 I/O expansion option connector / two external 2GBps small form factor pluggable ports
Management modules	*Std:* one; *max:* one or two / hot-swap / rear access / comprehensive system management functions / PowerPC® 401 controller / communicates with integrated system management processor on each HS20 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 / *1XX:* 1200 *2XX:* 1800 *3XX:* 2000 watts at 220v / both redundant to each other (N+N redundancy) / two std modules supply power to all modules and blade bays 1 through 6 / power for bays 7 through 14 requires two additional power modules in bays 3 and 4 (redundant to each other) / worldwide / voltage-sensing / auto-restart / no fans power module(s)
Blower modules	*Std:* two; *max:* two / hot-swap / redundant / variable speed / rear access / 325 cubic ft per min (CFM) / front to back airflow
Mechanical	**EIA 19" rack models (7U[4])** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 ER, NetBAY42 SR)
CD / diskette / USB	*1XX/2XX:* 24X-10X[6] CD-ROM *3XX:* 8X-24X[6] DVD-ROM / 3.5" 1.44MB diskette drive / one USB port (Version 1.1) / all USB interface / not removable / front access / shared by up to 14 blade servers / requests for CD-ROM, diskette drive, and USB port by pressing CD select button on server blade front panel
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions
Ports	*Rear:* keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / *Front:* one USB (Version 1.1)
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures
Ethernet	One of the dual integrated gigabit ethernet controllers on each HS20 blade servers connects to an optional *4-port GB Ethernet Switch Module* (the second HS20 ethernet controller requires a second optional *4-port GB Ethernet Switch Module*)
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software
System LED panel	System LED panel provides power-on, location, over-temperature, information, and system-error conditions

NetBAY 1U Flat Panel Monitor Console Kit (with kybd/monitor)	32P1031	IBM 1200W Power Supply Module (includes two modules)	48P7052
NetBAY 2U Flat Panel Monitor Console Kit (with kybd/monitor)	32P1702	IBM 1800W Power Supply Module (includes two modules)	13N0570
NetBAY ACT Local Console Manager (CAT5 KVM cabling)	1735L04	IBM 2000W Power Supply Module (includes two modules)	26K4816
NetBAY ACT Remote Console Manager (CAT5 KVM cabling)	1735R16	IBM KVM/Redundant Management Module	48P7055
NetBAY ACT 250mm KVM Conversion Option	32P1636	IBM BladeCenter 4-port GB Ethernet Switch Module	48P7054
NetBAY ACT 1.5m KVM Conversion Option	32P1652	IBM BladeCenter 2-port Fibre Channel Switch Module	48P7062
IBM Sleek 2-Button Stealth Black Mouse	28L3673	IBM BladeCenter Acoustic Attenuation Module (for rear)	49P2694
NetBAY42 Enterprise Rack Cabinet	930842S	IBM FAStT700 Fibre Channel Storage Server	17421RU
NetBAY42 Standard Rack Cabinet	9306420	IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
NetBAY25 Standard Rack Cabinet	9306250	• Other options at **ibm.com**/pc/us/accessories	
APC Smart-UPS 5000RMB	37L6861	• Solutions available from IBM BladeCenter Alliance program partners	



- 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 WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **On site service upgrade options (in eligible locations):[7]**
  - **3 year IOR 24x7, 2 hr avg response** (ServicePac® part num 21P2074)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 21P2073)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 21P2072)
  - **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9247)
  - **5 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9249)
  - **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- **24x7[14] toll-free support for warranty issues during the warranty**

See footnotes for important warranty information • = Hot-swap

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US models announced September 24, 2002 (1XX) or October 14, 2003 (2XX)

✂ US models withdrawn effective December 30, 2003 (1XX). 1200W Power module withdrawn effective February 24, 2004

Reserved

AMD Opteron LS20 for IBM @server BladeCenter™

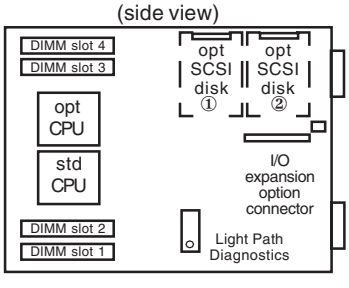
xREF by eServer Field Skills Enablement Team

IBM® Type-model	Qty x Processor[1]	Speed/Core	Memory	L2 Cache	Disk	Disk controller	Disk bays	SCSI support	Slots x bays	Mech-anical	Required chassis	Available date
8850-51U	1 x Opteron 246	2.0 GHz/SC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U[4] blade	BladeCenter	Apr 2005
8850-55U	1 x Opteron 270	2.0 GHz/DC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U[4] blade	BladeCenter	Apr 2005
8850-65U	1 x Opteron 275	2.2 GHz/DC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U[4] blade	BladeCenter	Jul 2005
8850-71U	1 x Opteron 250	2.4 GHz/SC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U[4] blade	BladeCenter	Apr 2005
8850-81U	1 x Opteron 252	2.6 GHz/SC	2GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U[4] blade	BladeCenter	Apr 2005

Positioning	*Ultra-dense, low power, full performance modular computing platform with superior performance*
Processor(s)	**Up to 2 x AMD® Opteron 275 Dual Core 2.2GHz,** simultaneously supports 32-bit and 64-bit computing
L2/L3 Cache	**1MB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O
SMP support	**2-way SMP** / up to two Opteron processors (same speed/cache size)
Implementation	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	**1GB** std / 8GB max[13] / two slots used / two slots available **PC3200** 266MHz registered 184-pin ECC DDR VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)
IDE controller/bays	None
SCSI disk controller	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	Support for SFF or legacy Ethernet or Fibre Channel I/O cards, Myrinet or InfiniBand Expansion cards
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical	Supported in IBM BladeCenter / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**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 *Passthrough Module* (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]
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon 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 (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply	Uses power module(s) in BladeCenter (type 8677)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

Low Power Opteron 246 Processor Upgrade	25R8891
Low Power Opteron 270 Processor Upgrade	25R8894
Low Power Opteron 275 Processor Upgrade	25R8895
Low Power Opteron 250 Processor Upgrade	25R8892
Low Power Opteron 252 Processor Upgrade	25R8893
2GB Memory Kit (2x1GB kit) DDR-SDRAM DIMM	73P5121
4GB Memory Kit (2x2GB kit) DDR-SDRAM DIMM	73P5122
IBM 36.4GB SFF Non-hot-swap 10K SCSI HD	90P1312
IBM 73.4GB SFF Non-hot-swap 10K SCSI HD	90P1313
AMD Opteron LS20 Low Profile Handle	25R7748
IBM SFF Fibre Channel Expansion Card	26K4841
IBM SFF Gigabit Ethernet Expansion Card	26K4842
IBM HS20 Fibre Channel Expansion Card	48P7061
Bladecenter 2000W Power Suppy Module	26K4816

Server blade
(side view)



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

Bay ① 2.5", 9.5mm, no front access, optional ThinkPad® SCSI disk
Bay ② 2.5", 9.5mm, no front access, optional ThinkPad® 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 server[13]:
146GB with two 73.4GB SFF SCSI disks

LIMITED WARRANTY[3]
- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

(LS20A) © IBM Corp. July 2005

IBM @server BladeCenter™ HS20 (July 2003)

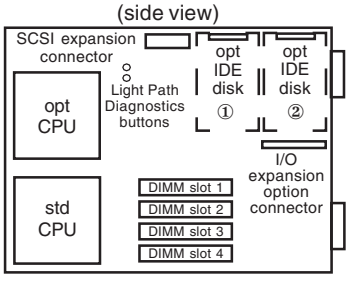
IBM® Type-model	Qty x Processor[1]	Memory	Frontside Bus Mhz	L3 Cache	Disk	Disk controller	Disk bays	SCSI support with optional stor exp unit	Slots x bays	Mech-anical	Required chassis	Available date
✂ 8832-21X	1 x Xeon™ 2.8BGHz	512MB	533Mhz	0MB	None	EIDE	2 fixed	2 hot-swap Ultra320	0x2	7U[4] blade	BladeCenter	July 2003
8832-31X	1 x Xeon 3.06GHz	512MB	533Mhz	0MB	None	EIDE	2 fixed	2 hot-swap Ultra320	0x2	7U[4] blade	BladeCenter	Oct 2003
✂✂ 8832-G1X	1 x Xeon 3.2GHz	1GB	533Mhz	1MB	None	EIDE	2 fixed	2 hot-swap Ultra320	0x2	7U[4] blade	BladeCenter	Nov 2003

Positioning	*Ultra-dense, highly manageable modular computing platform with superior performance*
Processor(s)	Up to **1 x Intel® Xeon 3.2GHz** with 533MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture
L2/L3 Cache	**512KB** L2 Cache / **1MB** L3 Cache (some) / 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	**512MB or 1GB** std / 8GB max[13] / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)
IDE controller/bays	Enhanced IDE ATA-100 controller in CSB6-U South Bridge / two connectors/buses on planar / each supports one 2.5" IDE disk / no cable as IDE disk attaches to riser card and tray (included with option kit) / Supports max of two IDE disks / space for only one IDE disk if an I/O expansion option installed [Fibre Channel] / **RAID-1 mirroring** standard
SCSI disk controller	None / **supports optional SCSI Storage Expansion Unit** (a blade occupying adjacent blade slot / connects to HS20 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports **RAID-1 mirroring** [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**ServerWorks® Grand Champion™ 4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / single-slot one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network-interface	**One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / diskette / USB	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) / 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 4.1 CD, Device Driver CD
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply	Uses power module(s) in BladeCenter (type 8677)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

Xeon 2.8BGhz/512KB L2 Cache Proc Upg	73P9073
Xeon 3.06Ghz/512KB L2 Cache Proc Upg	73P9074
Xeon 3.2Ghz/512KB L2 / 1MB L3 Proc Upg	13N0650
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 Storge 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*

Server blade
(side view)



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

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

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

Maximum internal disk capacity for each HS20 blade server[13]:
80GB with two 40GB EIDE disks or
293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(HS20B) © IBM Corp. July 2003

✂ Model withdrawn from marketing effective March 2004

✂✂ Model withdrawn from marketing effective April 2005

IBM @server BladeCenter™ HS20(8843) September 2005

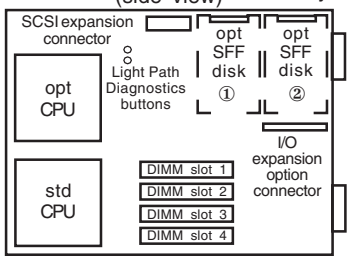
IBM® Type-GAV-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	SCSI optional stor exp unit	Support with	slots x bays	Mech-anical	Ethernet	Available date
8843-01y-01x	1 x Xeon™	2.8	1MB	800	512MB	None	Ultra320	2-fixed	2	Hot-swap Ultra320	0 x 2	7U[4] blade	2 x Gigabit	Sept 2004
8843-11y-11x	1 x Xeon	3.0	1MB	800	1GB	None	Ultra320	2-fixed	2	Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Sept 2004
8843-41y-41x	1 x Xeon	3.6	1MB	800	1GB	None	Ultra320	2-fixed	2	Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Sept 2004
8843-L1y-L1x	1 x Xeon	2.8 LV	1MB	800	512MB	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
☆ 8843-05U-E2x	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
☆ 8843-55U-35x	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-E7U-45x	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-E9U-45x	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 x Intel® Xeon up to 3.8GHz with 800MHz frontside bus (FSB)** / **EM64T** / **1-2MB L2 ECC Cache** / Hyper-Threading technology *L1y:* Features **Low Volage Processor** for reduced heat ouput allowing greater rack population
SMP - L2 Cache Implementation	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **1MB** std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet
Memory	**512MB/1GB** std / **8GB**[13] max / two slots used / two slots available / **PC2-3200** 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel
SCSI disk controller	**LSI Logic® 53C1020** SCSI controller / **Single channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports **RAID-1 & 1E mirroring** / One 16-bit channel (one internal) / *Internal channel:* one 2-drop 16-bit 68-pin LVD SCSI cable
SCSI Disk bays	**Two 2.5-inch Small Form Factor (SFF)** Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; **all SCSI bays Ultra320-enabled**) /
External Storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical Architecture/Chipset	7U Blade / Supported in IBM BladeCenter 8677-3XX or 8677-1XX/2XX (requires upgrade to 2000W power supply option 26K4816) **Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet	**Dual** gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network Interface	**One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / Diskette / USB	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 controller	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
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
Cooling Fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply(s)	Uses power module(s) in BladeCenter (type 8677)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

Xeon 2.8GHz/800/1MB L2 Cache EM64T Proc Upg	13N0692
Xeon 2.8GHz/800/2MB L2 Cache EM64T Proc Upg	25R8878
Xeon 3.0GHz/800/1MB L2 Cache EM64T Proc Upg	13N0693
Xeon 3.2GHz/800/1MB L2 Cache EM64T Proc Upg	13N0657
Xeon 3.4GHz/800/1MB L2 Cache EM64T Proc Upg	13N0658
Xeon 3.6GHz/800/1MB L2 Cache EM64T Proc Upg	13N0659
Xeon 3.68GHz/800/2MB L2 Cache EM64T Proc Upg	13N0697
512MB (2x256) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 CL3 ECC DDR2	73P3522
2GB (2x1GB) PC2-3200 ECC DDR2 ChipK RDIMM Kit	73P2866
4GB (2x2GB) PC2-3200 ECC DDR2 ChipK RDIMM Kit	73P2867
IBM 36.4GB 10K Ultra320 SCSI 2.5" SFF NHS HDD	90P1312
IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD	90P1313
BladeCenter SCSI Storage Exp Unit	26K4817
BladeCenter SFF Fibre Channel Exp Card	26K4841
BladeCenter SFF Gigabit Ethernet Exp Card	26K4842
BladeCenter Optical Pass-thru Module	02R9080

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

Server blade
(side view)



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

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 server[13]*:*
146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 146GB for total of 438GB)

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service**[3]
- **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**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

(HS20E) © IBM Corp. September 2005

☆ = models announced September 2005

IBM @server BladeCenter™ HS40

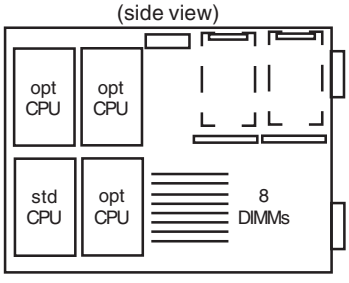
	IBM® Type-model	Qty x Processor[1]	L3 Cache	Memory	Frontside Bus Mhz	Disk	Disk controller	Disk bays	SCSI support with optional expansion unit	Slots x bays	Mech-anical	Required chassis	Available date
✂	8839-41X	1 x Xeon™ 2.8GHz MP	2MB	2GB	400Mhz	None	None	None	2 hot-swap Ultra320	0x2	6U[4] blade	BladeCenter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

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

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 Storge Expansion Unit (blade)	26K4847
IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)	48P7061
36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728

* *Disk requires SCSI Storage Expansion Unit*

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 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 server[13]:
293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY[3]
- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

(HS40A) © IBM Corp. February 2004

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

IBM @server BladeCenter™ HS40 (March 2004)

xREF by eServer Field Skills Enablement Team

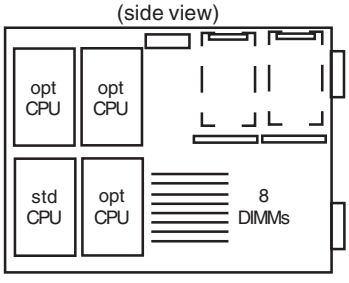
IBM® Type-model	Qty x Processor[1]	L3 Cache	Memory	Frontside Bus Mhz	Disk	Disk controller	Disk bays	SCSI support with optional expansion unit	Slots x bays	Mech-anical	Required chassis	Available date
8839-51X	1 x Xeon™ 2.2GHz MP	2MB	1GB	400Mhz	None	None	None	2 hot-swap Ultra320	0x2	7U[4] blade	BladeCenter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

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

Xeon 2.2Ghz/2MB L3 Cache Proc Upg	13N0656
Xeon 2.7Ghz/2MB L3 Cache Proc Upg	13N0655
Xeon 3.0Ghz/4MB L3 Cache Proc Upg	13N0654
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
IBM HS40 SCSI Storge Expansion Unit (blade)	26K4847
IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)	48P7061
36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728

** Disk requires SCSI Storage Expansion Unit*

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
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- 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 server[13]:
293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY[3]
- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information
US models announced March 2, 2004

(HS40B) © IBM Corp. March 2004

IBM @server BladeCenter™ HS40 (April 2004)

xREF by eServer Field Skills Enablement Team

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

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

Xeon 2.0Ghz/1MB L3 Cache Proc Upg	13N0651
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 Storge Expansion Unit (blade)	26K4847
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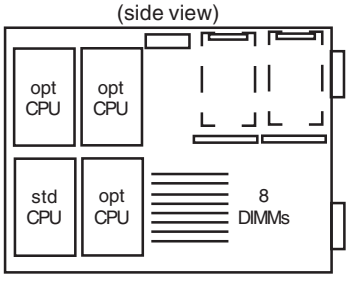
36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728

* *Disk requires SCSI Storage Expansion Unit*

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

Maximum internal disk capacity for each HS40 blade server[13]*:*
293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY[3]
- **3 year parts and labor**
- **International Warranty Service**[3]
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
- **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**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

(HS40C) © IBM Corp. April 2004

IBM @server™ BladeCenter™ T 8720 (DC power)

xREF by eServer Field Skills Enablement Team

IBM® Type-model	Supported blades	Blade bays std / max	Switch module bays std / max	Switch module bays (type)	Management module bays std / max	Power module bays std / max	Power Module Wattage	Blower module bays std / max	Mech-anical	Available date
8720-1RX	8832 HS20 / 8839 HS40	0 / 8	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	1300W	4 / 4	8U[4] rack	Jul 2004

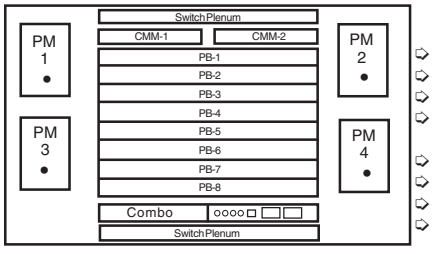
Positioning	*Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments*
Description	Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (combo CD/DVD drive, and ports for USB, keyboard, video, mouse)
Blade bays	Supports HS20 (8832), HS40 (8839) blades with Low Profile Handle, SCSI Storage Expansion Units and PCI I/O Expansion Blades / 8 hot-pluggable server bays / front access
Switch modules	*Std:* none; *max:* four / hot-swap / rear access
Ethernet Switch Module	Supports two *4-port GB Ethernet Switch Modules* in bays 1 and 2 / one Ethernet Switch Module required for ethernet support on HS20 blade server (two modules to support both ethernet controllers on HS20 and for failover redundancy) / bays 1 and 2 wired to the HS20 dual integrated ethernet controllers / four external ports / connects to std mgmt module / GB ethernet supported in bays 3-4 with optional Ethernet Expansion card on blade server
Fibre Channel Switch Module	Supports two *2-port or 6-port Fibre Channel Switch Modules* in bays 3 and 4 / one Fibre Channel Switch Module required for one of two ports on optional Fibre Channel Expansion Card (two modules to support both ports and for failover redundancy) / bays 3 and 4 wired to the HS20 I/O expansion option connector / two external 2GBps small form factor pluggable ports
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 / ports all located on rear of chassis
Power modules	*Std:* two in bays 1 and 2 , *max:* four / hot-swap / front access / input voltages between -38/-75 VDC Min/Max (-48 VDC nominal) / 4-Lug Terminal Block / 1300 watts / Two standard modules (in slots 1 & 2) supply power to switch bays 1 & 2, both management modules, blade bays 1 - 4, and the media tray; two additional power modules provide full system redundent power and power to switch bays 3 & 4 and blade bays 5 - 8 *All:* load balancing/ voltage-sensing / auto-restart / no fans in power module(s)
Blower modules	*Std:* four; *max:* four / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake
Mechanical	**EIA 19" rack models (8U[4])** x 20" deep / designed for EIA-310D and UTF Four Post Racks
Optical / USB	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	One of the dual integrated gigabit ethernet controllers on each blade servers connects to an optional *4-port GB Ethernet Switch Module* (the second HS20/HS40 ethernet controller requires a second optional *4-port GB Ethernet Switch Module*)
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software
System LED panel	System LED panel provides power-on, location, critical, major and minor alarm conditions

IBM BladeCenter T Redundent Management Module	90P3741
IBM BladeCenter HS20 Low Profile Handle	25K8358
IBM BladeCenter HS40 Low Profile Handle	25K8359
IBM Sleek 2-Button Stealth Black Mouse	28L3673
NetBAY42 Enterprise Rack Cabinet	930842S
Four Post Rack Mount Kit	90P3775
Two Post Rack Mount Kit	90P3774

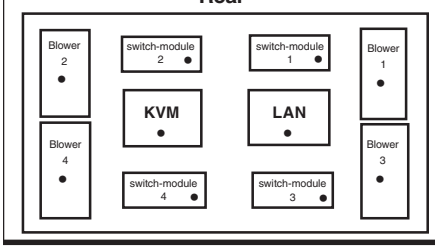
IBM 1300W DC Power Supply Module (x2)	90P3742
IBM BladeCenter PCI I/O Expansion Unit	90P3721
IBM BladeCenter 1GB Flash Disk Drive	90P3771
IBM BladeCenter 2GB Flash Disk Drive	90P3772
IBM BladeCenter 4GB Flash Disk Drive	90P3773
IBM FAStT700 Fibre Channel Storage Server	17421RU
IBM FAStT200 Storage Server	35421RU
IBM External USB Floppy Drive	05K9276
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1

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

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

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

• = Hot-swap

(BC1TA) © IBM Corp. March 2004

IBM @server™ BladeCenter™ T 8730 (AC power)

xREF by eServer Field Skills and Education Team

IBM® Type-model	Supported blades	Blade bays std / max	Switch module bays std / max	Switch module bays (type)	Management module bays std / max	Power module bays std / max	Power Module Wattage	Blower module bays std / max	Mech-anical	Available date
8730-1RX	8832 HS20 / 8839 HS40	0 / 8	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	1300W	4 / 4	8U[4] rack	Jul 2004

Positioning	*Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments*
Description	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 and ports for USB, keyboard, video, mouse)
Blade bays	Supports HS20 (8832), HS40 (8839) blades with Low Profile Handle, HS20, HS40 SCSI Storage Expansion Units and PCI I/O Expansion Blades / 8 hot-pluggable server bays / front access
Switch modules	*Std:* none; *max:* four / hot-swap / rear access
Ethernet Switch Module	Supports two *4-port GB Ethernet Switch Modules* in bays 1 and 2 / one Ethernet Switch Module required for ethernet support on HS20 blade server (two modules to support both ethernet controllers on HS20 and for failover redundancy) / bays 1 and 2 wired to the HS20 dual integrated ethernet controllers / four external ports / connects to std mgmt module / supported in bays 3 and 4 with optional Gigabit expansion card on Server Blade
Fibre Channel Switch Module	Supports two *2-port or 6-port Fibre Channel Switch Modules* in bays 3 and 4 / one Fibre Channel Switch Module required for one of two ports on optional Fibre Channel Expansion Card (two modules to support both ports and for failover redundancy) / bays 3 and 4 wired to the HS20 I/O expansion option connector / two external 2GBps small form factor pluggable ports
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 addititional power modules provide full system redundent power and power to switch bays 3 & 4, and blade bays 5 - 8 *All:* load balancing / voltage-sensing / auto-restart / no fans in power module(s)
Blower modules	*Std:* four; *max:* four / Calibrated Vectored Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake
Mechanical	**EIA 19" rack models (8U[4])** x 20" deep / designed for EIA-310D and UTF Four Post Racks
Optical / USB	24X-10X-24X-8X[6] Combo / Two USB port (Version 1.1) / all USB interface / front access (types A & C) / 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 / 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	One of the dual integrated gigabit ethernet controllers on each blade servers connects to an optional *4-port GB Ethernet Switch Module* (the second HS20/HS40 ethernet controller requires a second optional *4-port GB Ethernet Switch Module*)
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software
System LED panel	System LED panel provides power-on, location, critical, major and minor alarm conditions

IBM BladeCenter T Redundent Management Module	90P3741
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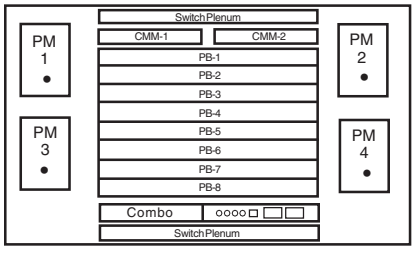
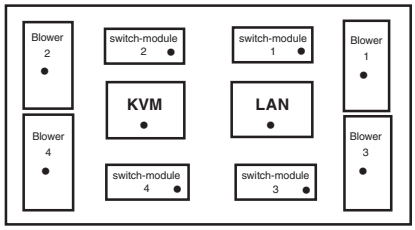
IBM Sleek 2-Button Stealth Black Mouse	28L3673
NetBAY42 Enterprise Rack Cabinet	930842S
Four Post Rack Mount Kit	90P3775
Two Post Rack Mount Kit	90P3774
APC Smart-UPS 5000RMB	37L6861
IBM 1300W AC Power Supply Module (x2)	90P3743
IBM BladeCenter PCI I/O Expansion Unit	90P3721
IBM BladeCenter 1GB Flash Disk Drive	90P3771
IBM BladeCenter 2GB Flash Disk Drive	90P3772
IBM BladeCenter 4GB Flash Disk Drive	90P3773
IBM FAStT700 Fibre Channel Storage Server	17421RU
IBM FAStT200 Storage Server	35421RU
IBM External USB Floppy Drive	05K9276
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1

- 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 enviroments
- Air Intake Filtering
- Predictive Failure Analysis® alerts blade server memory, processor(s), and optional disk(s) with IBM Director

Bay	Switch function
1	Ethernet link 1 for all 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 WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

• = Hot-swap

(BC1TA) © IBM Corp. March 2004

IBM @server BladeCenter™ HS20 (Low Profile Handle)

xREF by eServer Field Skills Enablement Team

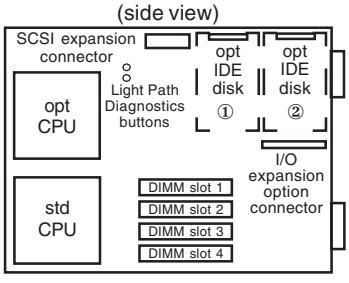
IBM® Type-model	Qty x Processor[1]	Memory	Frontside Bus Mhz	L3 Cache	Disk	Disk controller	Disk bays	SCSI support with optional stor exp unit	Slots x bays	Mech-anical	Required chassis	Available date
8832-GTX	1 x Xeon 3.2GHz	1GB	533Mhz	2MB	None	EIDE	2 fixed	2 HS Ultra320	0x2	8U[4] blade	BladeCenter T	Feb 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 max[13] / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)
IDE controller/bays	Enhanced IDE ATA-100 controller in CSB6-U South Bridge / two connectors/buses on planar / each supports one 2.5" IDE disk / no cable as IDE disk attaches to riser card and tray (included with option kit) / Supports max of two IDE disks / space for only one IDE disk if an I/O expansion option installed [Fibre Channel] / **RAID-1 mirroring** standard
SCSI disk controller	None / **supports optional SCSI Storage Expansion Unit** (a blade occupying adjacent blade slot / connects to HS20 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports **RAID-1 mirroring** [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**ServerWorks® Grand Champion™ 4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / single slot one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network-interface	**One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / diskette / USB	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) / 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 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 Proc Upg	13N0650
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 Storge 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*

Server blade
(side view)



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

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

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

Maximum internal disk capacity for each HS20 blade server[13]:
80GB with two 40GB EIDE disks or
293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY[3]
- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

(HS20D) © IBM Corp. February 2004

IBM @server BladeCenter™ HS20 Low Profile Handle (8843) January 2005

IBM® Type-GAV	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	SCSI optional stor	Support with exp unit	slots x bays	Mech-anical	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	7U[4] blade	2 x Gigabit	Feb 2005
8843-4Ty	1 x Xeon 3.6GHz		1MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap	Ultra320	0 x 2	7U[4] blade	2 x Gigabit	Feb 2005

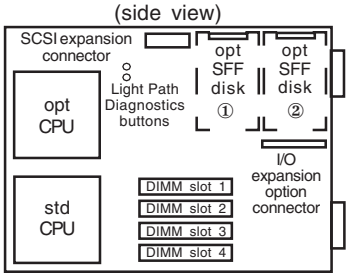
Processor(s)	**1 x Intel® Xeon 2.8 Low Voltage or 3.6 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **1MB L2 ECC Cache** / Hyper-Threading technology / Low Voltage Proccessors reduce heat output for increased rack density without increased cooling capacity
SMP - L2 Cache Implementation	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **1MB** std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet
Memory	**512MB/1GB** std / **8GB**[13] max / two slots used / two slots available / **PC2-3200** 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel /
SCSI disk controller	**LSI Logic® 53C1020** SCSI controller / **Single channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports **RAID-1 & 1E mirroring** (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
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 FAStT and NAS family of products)
Mechanical	7U Blade / Supported in IBM BladeCenter T 8720-1XX or 8730-1XX
Architecture/Chipset	**Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet	**Dual** gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network Interface	**One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / Diskette / USB	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 controller	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
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
Cooling Fans	Uses cooling from BladeCenter T (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply(s)	Uses power module(s) in BladeCenter T (type 8720/30)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

Xeon 2.8 GHz/800/1MB Low Volt EM64T Proc Upg	13N0699
Xeon 3.6 GHz/800/1MB L2 Cache EM64T Proc Upg	13N0659
512MB (2x256) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 CL3 ECC DDR2	73P3522
2GB (2x1GB) PC2-3200 ECC DDR2 ChipK RDIMM Kit	73P2866
4GB (2x2GB) PC2-3200 ECC DDR2 ChipK RDIMM Kit	73P2867
IBM 36.4GB 10K Ultra320 SCSI 2.5"SFF NHS HDD	90P1312
IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD	90P1313
BladeCenter SCSI Storage Exp Unit	26K4817
BladeCenter SFF Fibre Channel Exp Card	26K4841
BladeCenter SFF Gigabit Ethernet Exp Card	26K4842
BladeCenter Optical Pass-thru Module	02R9080
BladeCenter SCSI Storage Expansion Unit	26K4817
17-inch Flat Panel Monitor Console Kit w/ US Kybd	17231UX

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

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

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

LIMITED WARRANTY[3]

- **3 year parts and labor**
- **International Warranty Service**[3]
- **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**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

IBM @server BladeCenter™ HS40 (Low Profile Handle)

xREF by eServer Field Skills Enablement Team

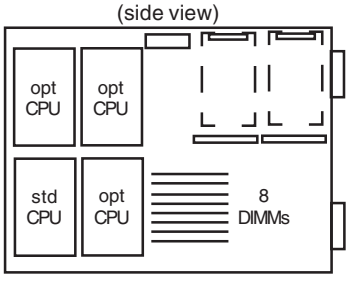
IBM® Type-model	Qty x Processor[1]	L3 Cache	Memory	Frontside Bus Mhz	Disk	Disk controller	Disk bays	SCSI support with optional exp. unit	Slots x bays	Mech-anical	Required chassis	Available date
8839-6TX	1 x Xeon™ 2.8GHz MP	2MB	2GB	400Mhz	None	None	None	2 H-S Ultra320	0x2	8U[4] blade	BladeCenter T	Mar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

Positioning	*Ultra-dense, highly manageable modular computing platform with superior 4-way performance*
Processor(s)	Up to **1 x Intel® Xeon 2.8GHz MP** with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture
L2/L3 cache	**512KB L2 Cache** / **2MB L3 Cache** / on die of processor / at processor speed
SMP support	**4-way SMP** / up to four Xeon MP Processors (same speed/cache size)
Implementation	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 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
Architecture / chipsets	**ServerWorks® Grand Champion™ 4.0 LE** / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / 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	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Systems mgmt	**Intel integrated Baseboard Management Controller** (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply	Uses power module(s) in BladeCenter (type 8677)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

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 Storge 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*

Server blade
(side view)



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

- Stealth black front bezel
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- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS40 blade server[13]:
293.6GB* with two 146.8GB SL SCSI disks

LIMITED WARRANTY[3]
- **3 year parts and labor**
- **International Warranty Service[3]**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
- **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**
- **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

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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 perfomance.

[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 respresentations or warranties regarding non-IBM products and services that are ServerProven, including but not limited to the implied warranties of merchantability and fitness for particular purpose. These products are offered and warranted by third parties, not IBM.

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

[17] Some software may differ from its retail version (if available), and may not include user manual or all program functionality. Software license agreements may apply.

[18] Diskettes and hard copy documentation available at extra charge.

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

[20] Statement of direction and subject to availability.

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

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

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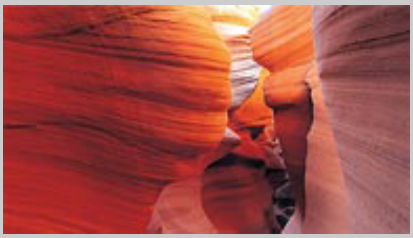

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