



## xSeries Reference (xREF)

including

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

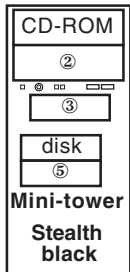
November 15, 2005

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

Positioning	<i>Uniprocessor, entry server designed to meet small business needs and budgets</i>												
Processor(s)	<b>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)</b>												
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	<b>256MB or 512MB / 8GB<sup>13</sup> 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)</b>												
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	<b>Intel E7230 chipset</b> / 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	<i>Some: CD-ROM: 48X-20X<sup>6</sup> CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X<sup>6</sup> / None standard</i>												
Ports	<i>Front: two USB (Ver 2.0); Back: two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)</i>												
Diagnostics Systems mgmt	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD												
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	<b>ServerGuide™</b> (CD-based automated network OS installation and configuration tool) included and IBM Director (system hardware mgmt software) optional					512MB PC2-4200 CL3 ECC DDR2 RoHS 2x1GB PC2-4200 CL3 ECC DDR2 RoHS 2x2GB PC2-4200 CL3 ECC DDR2 RoHS					30R5148 30R5149 30R5150		
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black)					IBM 80GB SATA-150 (7.2K) simple-swap HDD					39M4500		
Cooling fans	Three variable speed fans (cpu heatsink, rear, power supply) / not redundant / not hot-swap					IBM 160GB SATA-150 (7.2K) simple-swap HDD					39M4504		
Power supply	310 watts / universal / manual switching / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)					IBM 250GB SATA-150 (7.2K) simple-swap HDD					39M4508		
						48X/32X/48X/16X Max <sup>6</sup> 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 <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>							



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<sup>3</sup>**

- ✦ 1 year parts and labor
- ✦ International Warranty Service<sup>3</sup>
- ✦ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ✦ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>8</sup>

See footnotes for important warranty information

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

IBM® Machine Type	GAV model	Processor	GHz <sup>1</sup>	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 <sup>13</sup> 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 <sup>4</sup> 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 / SMC® 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 <sup>6</sup> 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				256MB PC2700 CL2.5 ECC DDR UDIMM				06P4053				
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				512MB PC2700 CL2.5 ECC DDR UDIMM				06P4054				
					1GB PC2700 CL2.5 ECC DDR UDIMM				06P4055				
					256MB PC3200 CL2.5 ECC DDR UDIMM				06P4049				
Software	ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities				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				
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black)				IBM 36.4GB 10000 rpm hot-swap U320 HDD				32P0726				
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SCSI models / not redundant / not hot-swap				32X/10X/40X/16X Max <sup>6</sup> CD-RW/DVD (black)				22P6973				
Power supply	340 watts / universal / auto switch / Automatic Server Restart (ASR) / not hot-swap / no redundancy / cooling fan in power supply (variable speed)				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 <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>												

Slot 1: fullsize, 64-bit 66MHz, PCI-X (3.3v)	✦ Removable left side panel
Slot 2: fullsize, 64-bit 66MHz, PCI-X (3.3v)	✦ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)	✦ Advanced Configuration Power Interface (ACPI) 1.0
Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)	✦ Device Drivers and Diagnostics CD-ROM included
Slot 5: fullsize, 32-bit 33MHz, PCI 2.2 (5v)	✦ 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)

**CD-ROM**

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

**Mini-tower Stealth black**

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

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

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

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

- ✦ 1 year parts and labor
- ✦ International Warranty Service<sup>3</sup>
- ✦ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ✦ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9512)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9511)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9510)
  - 3 year IOR 9x5, NBD response (ServicePac part num 69P9509)
- ✦ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ✦ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

# IBM eServer™ xSeries™ 206 (August 2004)

xREF by eServer Field Skills and Education Team

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

IBM® Machine Type	GAV model	Processor	GHz	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<sup>13</sup> 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<sup>4</sup> 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<sup>6</sup> 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)

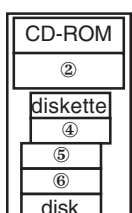
**Graphics controller** SVGA / ATI® Radeon™ 7000M / 16MB SDRAM std/max / on planar / analog 15-pin

**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  
 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<sup>6</sup> 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](http://ibm.com/pc/us/accessories)

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

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

<p>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)</p>  <p><b>Mini-tower Stealth black</b></p>	<p>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)</p> <p>◇ 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</p>	<ul style="list-style-type: none"> <li>◇ Removable left side panel</li> <li>◇ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup</li> <li>◇ Advanced Configuration Power Interface (ACPI) 1.0</li> <li>◇ Device Drivers and Diagnostics CD-ROM included</li> <li>◇ Four stabilizing feet</li> <li>◇ Handle grip on top</li> <li>◇ H 17.25" x W 6.5" x D 19.0"</li> <li>◇ H 448mm x W 165mm x D 483mm</li> <li>◇ 35 to 42 pounds (15.9 to 19.1kg)</li> </ul> <p><b>Maximum SATA capacity:</b>                  500GB<sup>13</sup> (2 disks x 250GB) w/ optional ServeRAID 7t (4 disks x 1TB)  <b>Maximum hot-swap SCSI capacity:</b>                  439.2GB<sup>13</sup> (3 disks x 146.4GB)  <b>Maximum fixed SCSI capacity:</b>                  585.6GB<sup>13</sup> (4 disks x 146.4GB)</p>	<p><b>LIMITED WARRANTY<sup>3</sup></b>                  ⇨ 1 year parts and labor                  ⇨ International Warranty Service<sup>3</sup>                  ⇨ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time                  ⇨ On site service upgrade options (in eligible locations):<sup>7</sup></p> <ul style="list-style-type: none"> <li>• 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9512)</li> <li>• 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9511)</li> <li>• 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9510)</li> <li>• 3 year IOR 9x5, NBD response (ServicePac part num 69P9509)</li> </ul> <p>⇨ Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a>                  ⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>8</sup></p>
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See footnotes for important warranty information

◀ = Models announced January 18, 2005

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

IBM® Machine Type	GAV-model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum PCI slots Capacity	x bays	Hard disk bays	Power Supply	Ethernet	Available date	
8485/8490	10y-10x	Pentium® 4 531	3.0GHz <sup>1</sup>	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 Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*  
**Intel® Pentium 4 up to 3.4GHz Single Core 800MHz FSB / Pentium D up to 3.0GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**  
 L2 cache **Up to 2MB** std on Pentium 4 / **2x1MB** std on Pentium D  
 Implementation Motherboard contains one LGA-775 socket, four DIMM sockets, some: four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI) some: six slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI, 2 PCI-X), integrated SATA and Gigabit Ethernet.  
 SMP support No SMP support / no processor upgrade

Memory **512MB or 1GB** std / 8GB<sup>13</sup> 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 Server RAID™ 8e (RAID 0, 1) / on planar / supports SATA or SAS interface

Rack support 5U<sup>4</sup> 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<sup>6</sup>** 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), **Server RAID™** (RAID management), IBM Director (system hardware management software) and many utilities  
 Keyboard / mouse Optional  
 Cooling fans Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap  
 Power supply Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed)

- 512MB PC2-4200 CL3 ECC DDR2RoHS
- 2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS
- 4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS
- IBM 80GB SATA (7.2K) simple-swap HDD
- IBM 160GB SATA (7.2K) simple-swap HDD
- IBM 250GB SATA (7.2K) simple-swap HDD
- 80GB Hot-Swap SATA HDD
- 160GB Hot-Swap SATA HDD
- 250GB Hot-Swap SATA HDD
- 73GB 10K 3.5" SAS Hot-Swap HDD
- 146GB 10K 3.5" SAS Hot-Swap HDD
- 300GB 10K 3.5" SAS Hot-Swap HDD
- 36GB 15K 3.5" SAS Hot-Swap HDD
- 73GB 15K 3.5" SAS Hot-Swap HDD
- 48X/32X/48X/16X Max® CD-RW/DVD-ROM Combo (black)
- IBM Remote Supervisor Adapter II (PCI adapter)
- IBM 5Ux20D Tower-to-Rack Kit
- IBM Server RAID-7t SATA Integrated Controller
- Other options at [ibm.com/pc/us/accessories](http://ibm.com/pc/us/accessories)

All:  
 Slot 1: fullsize, 64-bit PCI-E x8 (4GBps)  
 Slot 2: fullsize, 64-bit PCI-E x1 (500MBps)  
 Slot 3: fullsize, 32-bit 33MHz, PCI 2.2 (5v)  
 Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)  
 Some:  
 Slot 5: fullsize, 64-bit 66MHz, PCI-X (3.3v)  
 Slot 6: fullsize, 64-bit 66MHz, PCI-X (3.3v)  
 Bay ① 5.25", HH 1.6", access, CD-ROM  
 Bay ② 5.25", HH 1.6", access, open (no disk)  
 Bay ③ 3.5", SL 1", access, open  
 Bay ④ 3.5", SL 1", access, open  
 Bay ⑤ 3.5", SL 1", access, open  
 Bay ⑥ 3.5", SL 1", access, open  
 Bay ⑦ 3.5", SL 1", access, std disk (some)

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

Maximum SATA capacity:  
 1TB<sup>13</sup> (4 disks x 250GB)  
 Maximum hot-swap SAS capacity:  
 1.2TB<sup>13</sup> (4 disks x 300GB)

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

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

- ◇ 1 year parts and labor standard 8485 MTM
- ◇ 3 year parts and labor standard 8490 MTM
- ◇ International Warranty Service<sup>3</sup>
- ◇ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ◇ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9512)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9511)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9510)
  - 3 year IOR 9x5, NBD response (ServicePac part num 69P9509)
- ◇ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ◇ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Processor	GHz <sup>1</sup>	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 <sup>2</sup>	Ultra320 10K	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	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	None (4 fixed)	6 x 7	One fixed	Gigabit	Feb 2004
8649-6AX	1 x Xeon	3.06	512KB	533	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Feb 2004
8649-6BX	1 x Xeon	3.06	512KB	533	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Feb 2004

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

Memory **512MB** std / 8GB<sup>13</sup> max / two slots used / two slots available / **PC2100** 266MHz CL2.5 registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 512MB and greater DIMMs

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

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

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

Ethernet One gigabit 10/100/1000 ethernet controller / Broadcom BCM5703i / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 1.0 / one rear RJ-45 port

CD-ROM / diskette Ports *CD-ROM:* 48X-20X<sup>6</sup> 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)

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

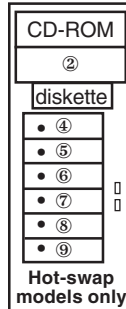
Graphics controller SVGA / ATI® RageXL / on Mini PCI adapter / 8MB SDRAM std and max / PCI 2.2 32-bit 33MHz / analog 15-pin D-Sub conn

Security Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)  
 Xeon 2.67 GHz/533/512KB L2 Cache Proc Upg 24P7861  
 Xeon 2.80 GHz/533/512KB L2 Cache Proc Upg 24P8054  
 Xeon 3.06 GHz/533/512KB L2 Cache Proc Upg 24P8122  
 2x256MB PC2100 CL2.5 ECC non-Chipkill DIMM Kit 73P2868  
 512MB PC2100 CL2.5 ECC DDR-SDRAM 33L5038

Software **ServerGuide™** (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities  
 1GB PC2100 CL2.5 ECC DDR-SDRAM DIMM 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<sup>6</sup> 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

Keyboard / mouse IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)  
 Cooling fans up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)  
 All: not redundant / not hot-swap / all variable speed  
 Power supply(s) *Some:* one 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)  
 Other options at [ibm.com/pc/us/accessories](http://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  
 Bay ⑧ 3.5", SL 1", no access, not hot-swap  
 Bay ⑨ 3.5", SL 1", no access, not hot-swap  
*Maximum internal SCSI disk capacity<sup>13</sup>:*  
 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<sup>3</sup>**

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

IBM® Type-GAV-model	Processor	L2 GHz <sup>1</sup> 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 <sup>2</sup> 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) SMP - L2 Cache Implementation: **1 x Intel® Xeon up to 3.2 GHz with 800MHz frontside bus (FSB) / EM64T / 1MB L2 ECC Cache / Hyper-Threading technology** / 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, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)

Memory: **512MB** std / 16GB<sup>13</sup> max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-conductor slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater

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

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

Mechanical: 4U<sup>4</sup> 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 E7250 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface

Ethernet: One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port  
CD-ROM / diskette Ports: **CD-ROM:** 48X-20X<sup>6</sup> CD-ROM, IDE / **Diskette:** 3.5" 1.44MB diskette drive  
*Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)

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

Graphics controller: SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector  
Security: Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)

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

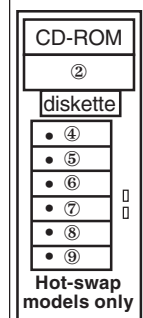
Xeon 2.80 GHz/800/1MB L2 Cache EM64TProc Upg	13N0671
Xeon 3.00 GHz/800/1MB L2 Cache EM64TProc Upg	13N0672
Xeon 3.2 GHz/800/1MB L2 Cache EM64TProc Upg	13N0673
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	73P2865
2GB (2x1GB) 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 <sup>6</sup> CD-RW internal (black)	22P6976
IBM Remote Supervisor Adapter II (PCI adapter)	53P2984
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](http://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 adapters  
\*\* slot for opt IBM ServeRAID-6i+

- ◆ 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

Bay ① 5.25", HH 1.6", access, CD-ROM  
Bay ② 5.25", HH 1.6", access, open  
Bay ③ 3.5", SL 1", access, diskette  
**Hot-swap models:**  
Six bays ④ to ⑨ 3.5", SL 1", access, hot-swap  
**Simple-swap models:** 2 std, 2 avail (up to 4 SATA HDDs maybe added with ServeRAID 7t controller)  
Bay ④ 3.5", SL 1", simple-swap  
Bay ⑤ 3.5", SL 1", simple-swap  
Bay ⑥ 3.5", SL 1", simple-swap  
Bay ⑦ 3.5", SL 1", fixed  
**Maximum internal disk capacity<sup>13</sup>:**  
SATA: 500GB (2 disks x 250GB); 1TB (4 disks x 250GB) w/ ServeRAID 7t  
SCSI: 880.8GB (6 disks x 146.8GB)



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

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

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

IBM® Type-GAV-model	Processor	L2 GHz¹ cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-40Y-40x	1 x Xeon™	3.0	2MB	800	512MB	80GB² SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit Mar 2005
8648-44Y-44x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Mar 2005
8648-4By-4Bx	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Mar 2005
8648-50Y-50x	1 x Xeon	3.2	2MB	800	512MB	80GB SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit Mar 2005
8648-5AY-5Ax	1 x Xeon	3.2	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Mar 2005
8648-5BY-5Bx	1 x Xeon	3.2	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Mar 2005
8648-60Y-60x	1 x Xeon	3.4	2MB	800	512MB	80GB SATA 7200	SATA	3 simple-swap	6 x 7	One fixed	Gigabit Mar 2005
8648-6AY-6Ax	1 x Xeon	3.4	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit Mar 2005
8648-6BY-6Bx	1 x Xeon	3.4	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit Mar 2005
<b>Processor(s)</b> 1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB) / EM64T / 2MB L2 ECC Cache / Hyper-Threading technology <b>SMP - L2 Cache Implementation</b> 2-way SMP / up to two Xeon Processors (same speed/cache size) / 2MB std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)											
<b>Memory</b> 512MB std / 16GB¹³ max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / PC2-3200 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-conductor slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / <b>Error Checking and Correcting (ECC)</b> 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											
<b>SATA disk controller</b> Dual Channel SATA-150 controller (150MB/sec / two connectors on planar / supports ServeRAID™ 7e <b>SCSI disk controller</b> 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											
<b>Cables</b> One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM), <b>RAID Controller</b> IBM ServeRAID 7e (RAID 0 Or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller											
<b>Mechanical</b> 4U⁴ Tower (rack mount support via tower-to-rack kit option) <b>Bus slots (see below)</b> One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots <b>Chipset</b> Intel E7525 chipset / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface											
<b>Ethernet</b> 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 <b>CD-ROM / diskette Ports</b> CD-ROM: 48X-20X* CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive Front: two USB (Ver 2.0); Back: two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)											
<b>Diagnostics</b> Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD <b>Systems mgmt cntrl</b> 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) <b>Graphics controller</b> SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector											
<b>Security</b> 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)											
<b>Software</b> ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities											
<b>Keyboard / mouse</b> IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2) <b>Cooling fans</b> 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 <b>Power supply(s)</b> 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)											

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-swap

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

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

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

- ◆ 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

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 Max⁶ 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](http://ibm.com/pc/us/accessories)

**LIMITED WARRANTY³**

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

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



IBM® Type-GAV-model	Processor	L2 GHz <sup>1</sup> 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 <sup>2</sup> 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 Implementation **2-way SMP / up to two Xeon Processors (same speed/cache size) / 2MB std and max / at processor speed**  
 Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)

Memory **512MB std / 16GB<sup>13</sup> 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 ChipKit™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater**

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

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

Mechanical **4U<sup>4</sup> 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 Ports **CD-ROM: 48X-20X® CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive**  
**Front: two USB (Ver 2.0); Back: two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)**

Diagnostics **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**

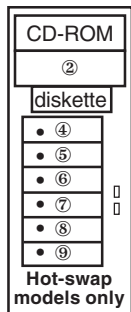
Keyboard / mouse **IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)**  
 Cooling fans **Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model)**

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® 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 7i SATA controller	71P8648

Other options at [ibm.com/pc/us/accessories](http://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 7i controller)**  
 Bay ④ 3.5", SL 1", simple-swap  
 Bay ⑤ 3.5", SL 1", simple-swap  
 Bay ⑥ 3.5", SL 1", simple-swap  
 Bay ⑦ 3.5", SL 1", fixed

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

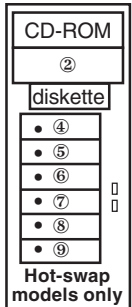
- ✦ Raven black color
- ✦ Removable left side panel
- ✦ Configuration/Setup Utility invoked by pressing F1 at startup
- ✦ BIOS Setup Utility via F1 at startup
- ✦ Adaptec Configuration Utility near startup by pressing CTRL+I
- ✦ DMI 2.2-compliant
- ✦ Adv Config Power Interface (ACPI) 1.0a
- ✦ Device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

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

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

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

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

IBM® Type-GAV-model	Processor	L2 GHz <sup>1</sup> 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 <sup>2</sup> 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 Implementation		2-way SMP / up to two Xeon Processors (same speed/cache size) / 2MB std and max / at processor speed											
Systemboard		contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)											
Memory		512MB std / 16GB <sup>13</sup> max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / PC2-3200 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater											
SATA disk controller		Dual Channel SATA-150 controller (150MB/sec / two connectors on planar / supports ServeRAID™ 7e											
SCSI disk controller		Adaptec® 7902 / dual channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports RAID-0 & 1 mirroring / Two 16-bit channels (one internal and one external) / Internal channel: Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; External channel: cable available as option pn 24P7929 from systemboard to rear external 68-pin connector											
Cables		One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),											
RAID Controller		IBM ServeRAID 7e (RAID 0 Or 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller											
Mechanical		4U <sup>4</sup> 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(via), 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 <sup>6</sup> CD-ROM, IDE / Diskette: 3.5" 1.44MB diskette drive											
Ports		Front: two USB (Ver 2.0); Back: two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)											
Diagnostics		Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD											
Systems mgmt cntrl		Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / support for optional Remote Supervisor Adapter II (provides continuous health monitoring and control)											
Graphics controller		SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector											
Security		Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)					Xeon 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 <sup>6</sup> 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			
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)											
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+													
 <p>CD-ROM ② diskette ④ ⑤ ⑥ ⑦ ⑧ ⑨ Hot-swap models only</p>		<p>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</p> <p>Hot-swap models: Six bays ④ to ⑨ 3.5", SL 1", access, hot-swp</p> <p>Simple-swap models: 2 std, 2 avail (up to 4 SATA HDDs maybe added with ServeRAID 7t controller)</p> <p>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</p>					<ul style="list-style-type: none"> <li>◇ Raven black color</li> <li>◇ Removable left side panel</li> <li>◇ Configuration/Setup Utility invoked by pressing F1 at startup</li> <li>◇ BIOS Setup Utility via F1 at startup</li> <li>◇ Adaptec Configuration Utility near startup by pressing CTRL+I</li> <li>◇ DMI 2.2-compliant</li> <li>◇ Adv Config Power Interface (ACPI) 1.0a</li> <li>◇ Device Driver and IBM Enhanced Diagnostics CD-ROM included</li> <li>◇ Four stabilizing feet</li> <li>◇ Handle grip on top</li> <li>◇ H 18.4" x W 6.5" x D 25.9"</li> <li>◇ H 467mm x W 165mm x D 658mm</li> <li>◇ 44 to 57 pounds (20 to 25.8kg)</li> </ul>					<p>Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a></p>	
<p>Maximum internal disk capacity<sup>13</sup>: SATA: 500GB (2 disks x 250GB); 1TB (4 disks x 250GB) w/ ServeRAID 7t SCSI: 880.8GB (6 disks x 146.8GB)</p>		<ul style="list-style-type: none"> <li>◇ Fixed disk models: metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling</li> <li>◇ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure</li> </ul>					<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <ul style="list-style-type: none"> <li>⇨ 1 year parts and labor</li> <li>⇨ International Warranty Service<sup>3</sup></li> <li>⇨ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time</li> <li>⇨ On site service upgrade options (in eligible locations):<sup>7</sup> <ul style="list-style-type: none"> <li>• 3 year IOR 9x5, NBD response (ServicePac® part num 96P2248)</li> <li>• 3 year IOR 9x5, 4 hr avg response (ServicePac part num 96P2249)</li> <li>• 3 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2250)</li> <li>• 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2251)</li> </ul> </li> <li>⇨ Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></li> <li>⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></li> </ul>						

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

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

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

**Positioning** *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<sup>4</sup>) 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<sup>6</sup> CD-ROM / IDE / 1.6" HH; **Diskette:** 3.5" 1.44MB diskette drive / dust cover  
**Rear ports** Rear: two USB (Vers 1.1), keyboard, mouse, parallel, **two** serial (9-pin), graphics (DB-15), ethernet (RJ-45), two RJ-45 (sys mgmt)  
**Front port / graphics** Front: one USB (Vers 1.1); **Graphics:** SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus

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

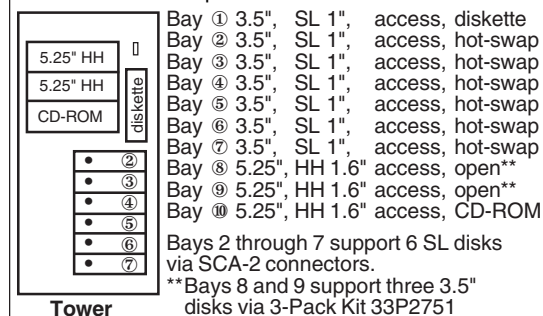
**Systems mgmt** **IBM Integrated system management processor (ISMP)** / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter with 20-pin connector on planar for continuous power (no ext pwr reqd)  
**Diagnostics** **Light Path Diagnostics™** panel providing LED map to failing part (under side cover) / Information LED Panel in front  
**Software** **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, others

**Keyboard / mouse** IBM 101-key keyboard / IBM mouse (both black)  
**Power supply** **MAX:** std/max: two/two 660 watt **All:** voltage-sensing / auto-restart / fan in each  
**M7X:** std/max: one/two 660 watt  
**xAX:** std/max: two/two 560 watt  
**Rest:** std/max: one/two 560 watt

**Fans** Four fans and two blowers / variable speed / hot-swap / redundant / PFA / fan in each power supply

Xeon 2.67GHz/512KB L2 Cache Proc Upg	71P8966
Xeon 2.8BGHz/512KB L2 Cache Proc Upg	71P8967
Xeon 3.06GHz/512KB L2 Cache Proc Upg	02R1988
2x256MB PC2100 Non-Chipkill DDR-SDRAM Kit	73P2868
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
IBM ServeRAID-6i Controller (adapter for slot 4)	71P8595
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
36.4GB 15K-2 80 Ultra320 SCSI Hot-Swap SL HDD	06P5776
3-Pack Ultra320 Hot-Swap Expansion Kit	33P2751
IBM 560W Hot-Swap Power Upgrade Kit*	02R1874
IBM 660W Hot-Swap Power Upgrade Kit (3.06 Only)	02R2015
Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>	
*Not backward compatible with 400Mhz FSB x235	

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



- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- LSI Logic Configuration Utility near startup by pressing CTRL+C
- Diagnostics (PC-Doctor™) by pressing F2 at startup
- ACPI2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Tower: H 17.31" x W 8.5" x D 27.6"
- 74 to 101 pounds
- Stealth black color

**All models:** Max int disk capacity: 1.321TB<sup>2</sup> with nine 146.8GB SL disks with 3-Pack Ultra160 Hot-Swap Expansion Kit

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

- **3 year parts and labor**
- **International Warranty Service<sup>3</sup>**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- **3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>**
  - **9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac® part num 21P2083)**
  - **24 hr x 7 day coverage, 4 hour average response (ServicePac part number 21P2084)**
  - **24 hr x 7 day coverage, 2 hour average response (ServicePac part number 21P2085)**
- **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

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**  
**Processor** Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price  
 Up to 1 x Intel® Xeon™ Processor 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<sup>4</sup>) 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<sup>6</sup> 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

<b>Systems mgmt</b>	<b>IBM Integrated system management processor (ISMP)</b> / 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 ( <b>std on 32y</b> ) (no ext pwr reqd)	Xeon 2.8GHz/1MB L2 Cache Proc Upg Xeon 3.4GHz/1MB L2 Cache Proc Upg Xeon 3.6GHz/1MB L2 Cache Proc Upg 512MB (2x256) PC2-3200 CL3 ECC DDR2 non-Chipk 1GB (2x512) PC2-3200 CL3 ECC DDR2 non-Chipk 1GB (2x512) PC2-3200 CL3 ECC DDR2 RDIMM 2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM 73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD 73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD IBM ServeRAID-7k Controller IBM Remote Supervisor Adapter II Slimline IBM T541 15" Flat Panel Color Monitor (black) 3-Pack Ultra320 Hot-Swap Expansion Kit IBM 670W Hot-Swap Power Upgrade Kit (NA) Other options at <a href="http://www.ibm.com/pc/us/accessories">www.ibm.com/pc/us/accessories</a>	13N0681 13N0684 13N0685 73P3523 73P3522 73P2865 73P2866 32P0727 32P0728 06P5776 32P0735 71K8642 73P9341 9512AB1 33P2751 25K9560
<b>Diagnostics</b>	<b>Light Path Diagnostics™</b> panel providing LED map to failing part (under side cover) / Information LED Panel in front		
<b>Software</b>	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director, others		
<b>Keyboard / mouse</b>	IBM 101-key keyboard / IBM mouse (both black)		
<b>Power supply</b>	std/max: one/two 670 watt / voltage-sensing / auto-restart / Fan in each std/max: four/six/ two fans (front), two fans on planar, (Opt) two fans (rear) / variable speed / hot-swap / redundant with optional rear fans / PFA / fan in each power supply		

<p>Slot 1: half-length, 32-bit 33MHz 5v PCI 2.2, Bus A                      Slot 2: full, PCI-Express 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</p> <p>Bay ① 3.5", SL 1", access, diskette                      Bay ② 3.5", SL 1", access, hot-swap                      Bay ③ 3.5", SL 1", access, hot-swap                      Bay ④ 3.5", SL 1", access, hot-swap                      Bay ⑤ 3.5", SL 1", access, hot-swap                      Bay ⑥ 3.5", SL 1", access, hot-swap                      Bay ⑦ 3.5", SL 1", access, hot-swap                      Bay ⑧ 5.25", HH 1.6" access, open**                      Bay ⑨ 5.25", HH 1.6" access, open**                      Bay ⑩ 5.25", HH 1.6" access, CD-ROM</p> <p>Bays 2 through 7 support 6 SL disks via SCA-2 connectors.                      **Bays 8 and 9 support three 3.5" disks via 3-Pack Kit 33P2751</p>	<ul style="list-style-type: none"> <li>⇒ Quick release adapter slots (no screws)</li> <li>⇒ Configuration/Setup Utility invoked by pressing F1 at startup</li> <li>⇒ Adaptec Configuration Utility near startup by pressing CTRL+I</li> <li>⇒ Diagnostics (PC-Doctor™) by pressing F2 at startup</li> <li>⇒ ACPI2.0-compliant</li> <li>⇒ Operator Information Panel (in front)</li> <li>⇒ 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</li> <li>⇒ Tower: H 17.31" x W 8.5" x D 27.6"</li> <li>⇒ 74 to 101 pounds</li> <li>⇒ Stealth black color</li> </ul>	<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <ul style="list-style-type: none"> <li>⇒ 3 year parts and labor</li> <li>⇒ International Warranty Service<sup>3</sup></li> <li>⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup></li> <li>⇒ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup> <ul style="list-style-type: none"> <li>• 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac<sup>®</sup> part num 21P2083)</li> <li>• 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 21P2084)</li> <li>• 24 hr x 7 day coverage, 2 hour average response (ServicePac part number 21P2085)</li> </ul> </li> <li>⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></li> </ul>
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See footnotes for important warranty information

• = Hot-swap

IBM® Type-model	Qty x Processor	L2 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8841-05U-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**  
**Processor** Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price  
 Up to 1 x Intel® Xeon™ Processor 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 / **Errors 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<sup>4</sup>) 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<sup>6</sup> 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)

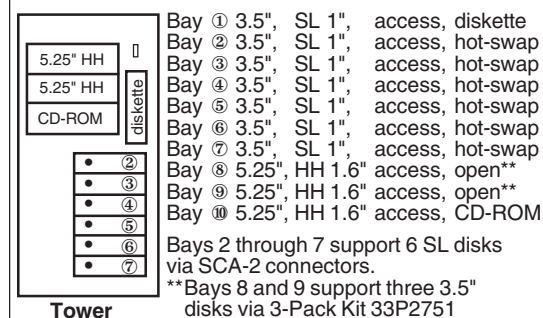
**Diagnostics** Light Path Diagnostics™ panel providing LED map to failing part (under side cover) / Information LED Panel in front

**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 <a href="http://www.ibm.com/pc/us/accessories">www.ibm.com/pc/us/accessories</a>	

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



- 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<sup>2</sup> with nine 146.4GB SL disks with 3-Pack Ultra 160 Hot-Swap Expansion Kit

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac<sup>®</sup> 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

• = Hot-swap

IBM® Type-model	Qty x Processor	L3 cache	Memory	ECC memory features	Disk	SCSI controller	Mechanical	Slots x disk 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 2.8GHz¹ with 400MHz frontside bus / Hyper-Threading technology									
L2 cache	512KB / on die of processor / at processor speed									
L3 cache	1MB or 2MB / on die of processor / at processor speed									
Processor upgrade Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI-X slots, one PCI slot, and integrated SCSI, ethernet, graphics									
Memory	Up to 3GB std / 24GB¹³ 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 (7U⁴) 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 slots¹⁰ available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers / 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-20X⁶ 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)					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 <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>				
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									

◉ 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

	<b>Rack or Tower</b>
	Diskette
	CD-ROM
	HH 5.25"
	HH 5.25"

- ◉ 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 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: 880GB² with twelve 73.4GB SL hot-swap SCSI disks

**LIMITED WARRANTY³**

◉ 3 year parts and labor

◉ International Warranty Service³

◉ On site, 8 am-5 pm, Mon-Fri coverage excluding holidays, next business day response time⁷

◉ 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>

◉ 24x7¹⁴ toll-free support for warranty issues during the warranty period⁸

IBM® Type-model	Qty x Processor	L3 cache	Memory	ECC memory features	Disk	SCSI controller	Mechanical	Slots x disk 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 <sup>1</sup> 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 Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) Systemboard contains four Intel 603-pin micro-PGA ZIP sockets, one memory board slot, six Active™ PCI-X slots, one PCI slot, and integrated SCSI, ethernet, graphics									
Memory	Up to 4GB std / 24GB <sup>13</sup> 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 <sup>4</sup> ) 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 <sup>10</sup> 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 <sup>6</sup> 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)					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 17L6889 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 <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>				
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									

<p>⊖ 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</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><b>Rack or Tower</b></p> <p>Standard hot-swap disk bays</p> <p>Optional hot-swap disk bays</p> <p>Diskette</p> <p>CD-ROM</p> <p>HH 5.25"</p> <p>HH 5.25"</p> </div> <p>Bay ① 3.5", SL 1", access, diskette Bay ② 5.25", HH 1.6" access, CD-ROM Bay ③ 5.25", HH 1.6" access, open* Bay ④ 5.25", HH 1.6" access, open* Bays 5 to 10 (six bays): standard 3.5" SL 1" hot-swap disk bays Bays 11 to 16 (six bays): optional 3.5" SL 1" hot-swap disk bays</p>	<p>Slot 1: 32-bit 33MHz 5v PCI, not hot-swap, Bus A; primarily for optional Remote Supervisor Adp</p> <p>Slot 2: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B</p> <p>Slot 3: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus B</p> <p>Slot 4: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C</p> <p>Slot 5: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus C</p> <p>Slot 6: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D</p> <p>Slot 7: full, 64-bit 100MHz 3.3v PCI-X, hot-swap, Bus D</p> <p>⊖ Setup Program is available by pressing F1 at startup; Diagnostics (PC-Doctor) by pressing F2 at startup; CTRL+A for SCSISelect Utility</p> <p>⊖ Removeable top cover</p> <p>⊖ Access adapters, memory, CPUs from top</p> <p>⊖ 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</p> <p>Maximum internal disk capacity: 880GB<sup>2</sup> with twelve 73.4GB SL hot-swap SCSI disks</p>	<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <p>⊖ 3 year parts and labor</p> <p>⊖ International Warranty Service<sup>3</sup></p> <p>⊖ On site, 8 am-5 pm, Mon-Fri coverage excluding holidays, next business day response time<sup>7</sup></p> <p>⊖ On site service upgrade options (in eligible locations):<sup>7</sup></p> <ul style="list-style-type: none"> <li>• 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 41L2738)</li> <li>• 3 year IOR 24x7, 2 hr avg resp (ServicePac part num 31L2723)</li> <li>• 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9223)</li> </ul> <p>⊖ <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></p> <p>⊖ 24x7<sup>4</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></p>
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See footnotes for important warranty information

• = Hot-swap

US models announced March 2004

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

Processors	<b>One or two 64-bit Intel® Xeon™ Processor MP 3.16 or 3.66GHz<sup>2</sup></b> with 667MHz frontside bus std / <b>NetBurst™ / Extended Memory 64 Technology™ (EM64T)</b> / Hyper-Threading technology																																
L2 cache	<b>1MB</b> / on die of processor / at processor speed / <b>Xcel4v™</b> Dynamic Server Cache																																
Processor upgrade Implementation	<b>4-way SMP</b> / up to four Xeon Processors MP (same speed/cache size) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics																																
Active Memory™	Up to <b>4GB</b> std / 64GB max <sup>12,13</sup> (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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™ / Memory ProteXion™</b> (redundant bit steering) and <b>Memory Mirroring™</b> and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)																																
SAS disk controller	<b>ALL:</b> Adaptec® AIC-9410 / <b>Dual-channel Serial Attached SCSI (SAS)</b> 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	<b>Up to Twelve</b> 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays																																
Mechanical	<b>EIA 19" rack models (7U<sup>4</sup>)</b> x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)																																
Chipset	<b>IBM XA-64e™ 3rd Generation chipset</b> / IBM Integrated Processor/Memory Controller (improved performance from earlier models) / 2 IBM PCI-X 2.0 Host Bridges / 1 supports adapter PCI 33MHz and 66MHz, slot for optional ServerRAID 8i (inc. graphics), ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge supports 4 PCI-X 2.0 slots																																
I/O Slots	Six total Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz																																
CD-ROM / diskette	IBM 24X Max SlimLine CD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive																																
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2																																
Graphics controller	SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																																
Ports	Rear: RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (Ver 2.0)																																
Security	Power-on and administrator passwords / unattended boot / selectable boot																																
Systems management	BMC standard / <b>Remote Supervisor Adapter II</b> 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	<b>Drop-down Light Path Diagnostics</b> / 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	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director, and others																																
Keyboard / mouse	Rack model: none standard / Tower model: IBM 104-key keyboard (PS/2) / IBM 3-button optical mouse (PS/2)																																
Power supplies	Std: two 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA																																
Cooling fans	Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor																																
Options	<table border="0"> <tr> <td>1GB PC2-3200 CL3 ECC RDIMM (2x512MB)</td> <td>73P2865</td> <td>IBM ServeRAID 6M U320 256MB Adapter</td> <td>02R0988</td> </tr> <tr> <td>2GB PC2-3200 CL3 ECC RDIMM (2x1GB)</td> <td>73P2866</td> <td>IBM 73.4GB 10K 3.5" SAS Hot-swap HDD</td> <td>26K5709</td> </tr> <tr> <td>4GB PC2-3200 CL3 ECC RDIMM (2x2GB)</td> <td>73P2867</td> <td>IBM 146GB 10K 3.5" SAS Hot-Swap HDD</td> <td>26K5710</td> </tr> <tr> <td>Active Memory 4-slot Expansion Card</td> <td>13M7409</td> <td>IBM 300GB 10K 3.5" SAS Hot-Swap HDD</td> <td>26K5711</td> </tr> <tr> <td>Xeon MP 3.16GHz/1MB L2 Cache Proc Upg</td> <td>13N0694</td> <td>Remote Supervisor Adapter II Slimline</td> <td>59P2984</td> </tr> <tr> <td>Xeon MP 3.66GHz/1MB L2 Cache Proc Upg</td> <td>13N0695</td> <td>SAS 3.5" 6-drive Backplane</td> <td>13M7864</td> </tr> <tr> <td>775 watt Hot-Swap Power Supply (WW)</td> <td>13M7415</td> <td>IBM 73.4GB 15K 3.5" SAS Hot-swap HDD</td> <td>26K5698</td> </tr> <tr> <td>IBM ServeRAID™-8i SA-SCSI Adapter</td> <td>13N2227</td> <td>IBM 146GB 15K 3.5" SAS Hot-Swap HDD</td> <td>26K5699</td> </tr> </table>	1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	73P2865	IBM ServeRAID 6M U320 256MB Adapter	02R0988	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	26K5709	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	26K5710	Active Memory 4-slot Expansion Card	13M7409	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	26K5711	Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	13N0694	Remote Supervisor Adapter II Slimline	59P2984	Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	13N0695	SAS 3.5" 6-drive Backplane	13M7864	775 watt Hot-Swap Power Supply (WW)	13M7415	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	26K5698	IBM ServeRAID™-8i SA-SCSI Adapter	13N2227	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	26K5699
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**LIMITED WARRANTY<sup>3</sup>**

- ↪ 3 year parts and labor
- ↪ International Warranty Service<sup>3</sup>
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↪ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 96P2253)
  - 3 year IOR 24x7, 2 hr avg response (ServicePac partnum 96P2254)
  - 4 year IOR 9x5, NBD response (ServicePac partnum 96P2255)
  - 5 year IOR 9x5, NBD response (ServicePac partnum 69P2259)
- ↪ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxueu.pdf>
- ↪ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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

Light Path Diag    **7U<sup>4</sup> Rack or Tower**

Removable Processor Board Tray

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

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

**All models:** Maximum internal disk capacity: 3.6TB with 12x 300GB<sup>2</sup> hot-swap SAS disks

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



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

Processors	<b>One or two 64-bit Intel® Xeon™ Processor MP 3.16 or 3.66GHz<sup>2</sup></b> with 667MHz frontside bus std / <b>NetBurst™ / Extended Memory 64 Technology™ (EM64T)</b> / Hyper-Threading technology																																
L2 cache	<b>1MB</b> / on die of processor / at processor speed / <b>Xcel4™</b> Dynamic Server Cache																																
Processor upgrade Implementation	<b>4-way SMP</b> / up to four Xeon Processors MP (same speed/cache size) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics																																
Active Memory™	Up to <b>4GB</b> std / 64GB max <sup>12,13</sup> (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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> / <b>Memory ProteXion™</b> (redundant bit steering) and <b>Memory Mirroring™</b> and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)																																
SAS disk controller	<b>ALL:</b> Adaptec® AIC-9410 / <b>Dual-channel Serial Attached SCSI (SAS)</b> 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	<b>Up to Twelve</b> 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays																																
Mechanical	<b>EIA 19" rack models (7U<sup>4</sup>)</b> x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)																																
Chipset	<b>IBM XA-64e™ 3rd Generation chipset</b> / IBM Integrated Processor/Memory Controller (improved performance from earlier models) / 2 IBM PCI-X 2.0 Host Bridges / 1 supports adapter PCI 33MHz and 66MHz, slot for optional ServerRAID 8i (inc. graphics), ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge supports 4 PCI-X 2.0 slots																																
I/O Slots	Six total Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz																																
CD-ROM / diskette	IBM 24X Max SlimLine CD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive																																
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2																																
Graphics controller	SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																																
Ports	Rear: RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (Ver 2.0)																																
Security	Power-on and administrator passwords / unattended boot / selectable boot																																
Systems management	BMC standard / <b>Remote Supervisor Adapter II</b> 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	<b>Drop-down Light Path Diagnostics</b> / 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	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director, and others																																
Keyboard / mouse	None standard (because rack-based)																																
Power supplies	Std: two 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA																																
Cooling fans	Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor																																
Options	<table border="0"> <tr> <td>1GB PC2-3200 CL3 ECC RDIMM (2x512MB)</td> <td>73P2865</td> <td>IBM ServeRAID 6M U320 256MB Adapter</td> <td>02R0988</td> </tr> <tr> <td>2GB PC2-3200 CL3 ECC RDIMM (2x1GB)</td> <td>73P2866</td> <td>IBM 73.4GB 10K 3.5" SAS Hot-swap HDD</td> <td>26K5709</td> </tr> <tr> <td>4GB PC2-3200 CL3 ECC RDIMM (2x2GB)</td> <td>73P2867</td> <td>IBM 146GB 10K 3.5" SAS Hot-Swap HDD</td> <td>26K5710</td> </tr> <tr> <td>Active Memory 4-slot Expansion Card</td> <td>13M7409</td> <td>IBM 300GB 10K 3.5" SAS Hot-Swap HDD</td> <td>26K5711</td> </tr> <tr> <td>Xeon MP 3.16GHz/1MB L2 Cache Proc Upg</td> <td>13N0694</td> <td>Remote Supervisor Adapter II Slimline</td> <td>59P2984</td> </tr> <tr> <td>Xeon MP 3.66GHz/1MB L2 Cache Proc Upg</td> <td>13N0695</td> <td>SAS 3.5" 6-drive Backplane</td> <td>13M7864</td> </tr> <tr> <td>775 watt Hot-Swap Power Supply (WW)</td> <td>13M7415</td> <td>IBM 73.4GB 15K 3.5" SAS Hot-swap HDD</td> <td>26K5698</td> </tr> <tr> <td>IBM ServeRAID™-8i SA-SCSI Adapter</td> <td>13N2227</td> <td>IBM 146GB 15K 3.5" SAS Hot-Swap HDD</td> <td>26K5699</td> </tr> </table>	1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	73P2865	IBM ServeRAID 6M U320 256MB Adapter	02R0988	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	26K5709	4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	73P2867	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	26K5710	Active Memory 4-slot Expansion Card	13M7409	IBM 300GB 10K 3.5" SAS Hot-Swap HDD	26K5711	Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	13N0694	Remote Supervisor Adapter II Slimline	59P2984	Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	13N0695	SAS 3.5" 6-drive Backplane	13M7864	775 watt Hot-Swap Power Supply (WW)	13M7415	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	26K5698	IBM ServeRAID™-8i SA-SCSI Adapter	13N2227	IBM 146GB 15K 3.5" SAS Hot-Swap HDD	26K5699
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**LIMITED WARRANTY<sup>3</sup>**

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

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

Light Path Diag **7U<sup>4</sup> Rack or Tower**

Removable Processor Board Tray

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

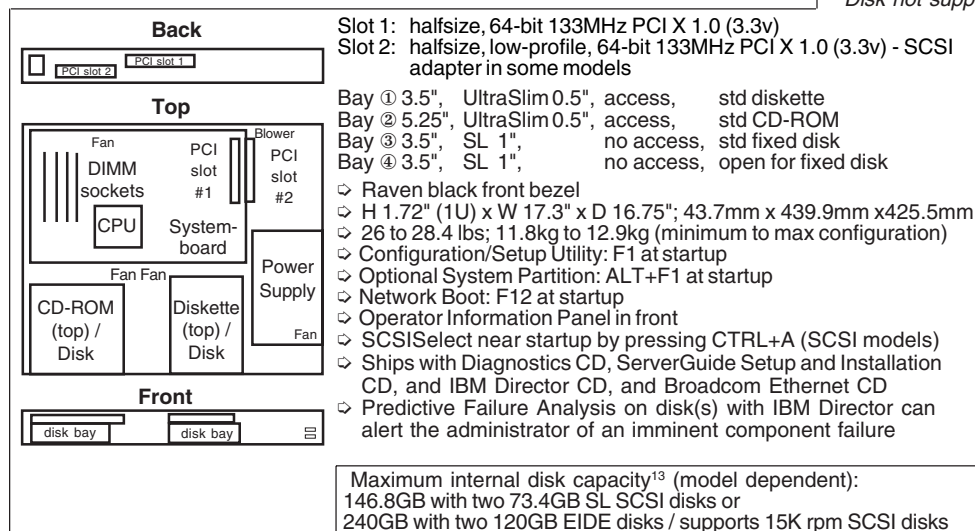
- Stealth black color
- Tool-free serviceability
- Tower Dimensions: H15.5" x W18.2" x D30"(762mm)
- Tower Weight: 149 to 180lbs; 67.6 to 81.7Kg
- Rack Dimensions: H12" x W17.5" x D28.2"
- Rack Dimensions: H306mm x W444mm x D715mm
- Rack Weight: 144 to 158lbs; 65.4 to 71.7Kg
- Access adapters, fans,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

**All models:** Maximum internal disk capacity: 3.6TB with 12x 300GB<sup>2</sup> hot-swap SAS disks

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

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

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



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

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

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

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 <sup>3</sup>	Available date
8836	1Mx 11X	Pentium 4® 2.8GHz	1MB	800	512MB	36.4GB SCSI	Ultra320	2 fixed	1U <sup>4</sup> 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 Processor(s) **A highly affordable, uni-processor, 1U rack-optimized server**  
 Intel® Pentium 4 up to 3.2GHz<sup>1</sup> 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<sup>13</sup> / 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.<sup>5</sup>; *SATA:* open bay;

Mechanical **EIA 19" Rack (1U<sup>4</sup>)** / 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<sup>6</sup> 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](http://ibm.com/pc/us/accessories)

\* Disk not supported in all x306 systems

**Back**  
 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)

**Top**  
 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

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

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

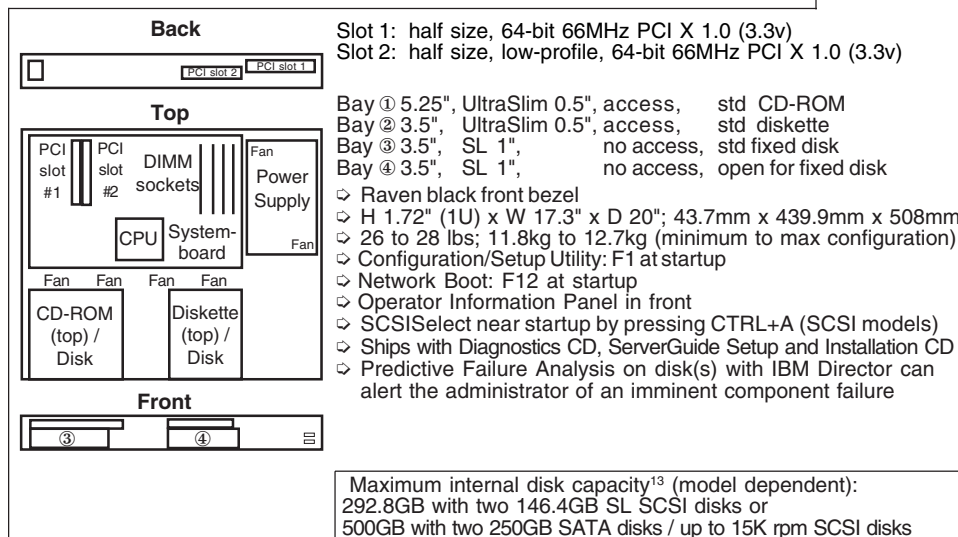
- ↪ 1 year parts and labor
- ↪ International Warranty Service<sup>3</sup>
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↪ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, NBD avg response (ServicePac®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

# IBM @server™ xSeries™ 306 (August 04)

xREF by eServer Field Skills and Education Team

For GAV systems, lowercase "v" 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 <sup>3</sup>	Available date
8836 - 4My	-41x	Pentium 4® 3.2GHz	1MB	800	512MB	36.4GB	SCSI Ultra320	2 fixed	1U <sup>4</sup> 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 <sup>4</sup> 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 <sup>4</sup> 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 <sup>1</sup> & 3.4GHz with 800MHz FSB optimized for <b>Extended Memory 64 Technology(EM64T)</b>												
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 <sup>13</sup> / one slot used / three slots available / <b>PC3200</b> 400Mhz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / memory bus runs at 2 x 200MHz / <b>Error Checking and Correcting (ECC)</b> memory controller												
SCSI disk controller	SCSI models: <b>Adaptec® 7901 chipset / single channel Wide Ultra320 SCSI</b> (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. <sup>5</sup> ; SATA: open bay, simple swap												
Mechanical Architecture / chipsets	EIA 19" Rack (1U <sup>4</sup> ) / rack-mount only Intel E7210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse												
Bus slots	(See below) two available PCI-X 1.0 66MHz / no hot-swap Active™ PCI slots / <b>half-length</b>												
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 <sup>6</sup> 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 Diagnostics	On planar / monitors system and processor temperature, fan failure, and voltages 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 / universal / auto-sensing / auto-restart support												
Power supply 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 <a href="http://www.ibm.com/pc/us/accessories">www.ibm.com/pc/us/accessories</a>		



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

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

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

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

IBM® Machine Type	GAV model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr <sup>3</sup>	Available date
8849/8891	10y-10x	Pentium® 4 531 3.0GHz	1MB	800	512MB	SATA	2 simple-swap	1U <sup>4</sup> 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<sup>13</sup> 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<sup>4</sup>) / 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<sup>6</sup> CD-ROM Slim/ IDE; Diskette: none**  
 Rear ports **Rear: serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)**  
 Front ports / Graphics **Front: two USB (Vers 2.0)**  
**ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz**

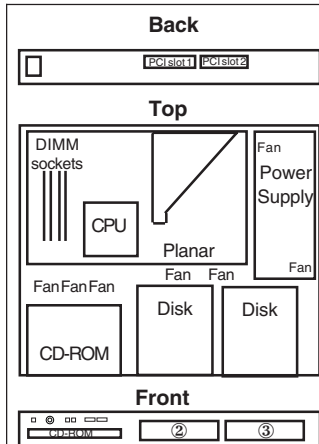
Console interconnects **No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)**  
 Systems mgmt **Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages**

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

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

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

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



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

Other options at [ibm.com/pc/us/accessories](http://ibm.com/pc/us/accessories)

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

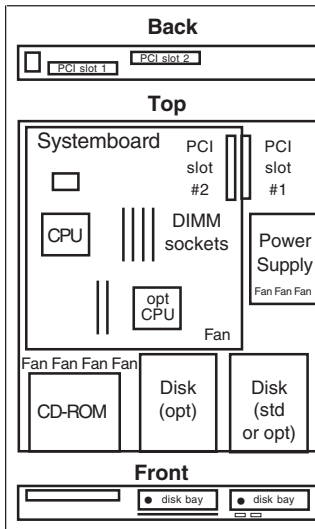
- ❖ 1 year parts and labor standard 8849 MTM
- ❖ 3 year parts and labor standard 8491 MTM
- ❖ International Warranty Service<sup>3</sup>
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

Maximum internal disk capacity<sup>13</sup> (model dependent):  
 600GB with two 300GB SAS disks or 500GB with two 250GB SATA disks

See footnotes for important warranty information

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

\* Disk not supported in all e325 systems



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

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

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

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

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

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

See footnotes for important warranty information

(X325A) © IBM Corp. August 2003

• = Hot-swap in some models

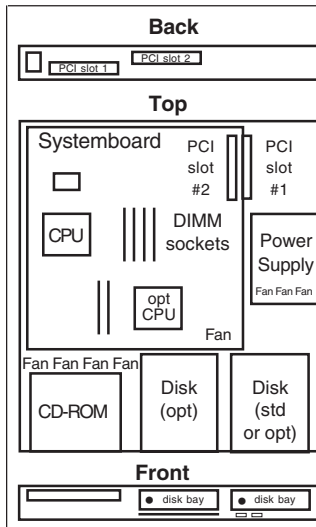
US models announced August 5, 2003

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

IBM® 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 <sup>3</sup>	Available date
8835-61X	1 x Opteron™ 248	2.2Ghz <sup>1</sup>	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 <sup>2</sup> EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Jan 2004
8835-71X	1 x Opteron 250	2.4Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Jun 2004
8835-72X	1 x Opteron 250	2.4Ghz	1MB	1GB	Chipkill	80GB EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Jun 2004

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

\* Disk not supported in all e325 systems



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

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

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

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

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

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

See footnotes for important warranty information

• = Hot-swap in some models

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

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 <sup>3</sup>	Available date
8848-51Y	1 x Opteron™ 246	2.0Ghz <sup>1</sup>	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 <sup>2</sup> 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<sup>13</sup> / 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

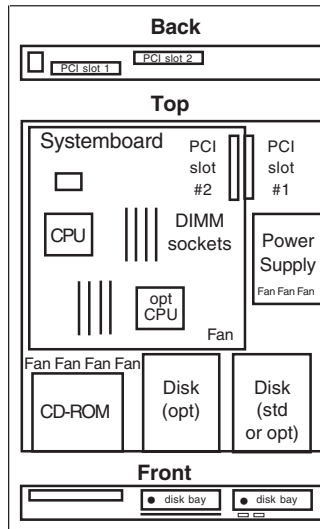
SCSI disk controller *All (not used on SATA models): LSI Logic® 53C1020 / Ultra320 SCSI controller* (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from 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 Architecture/chipsets **EIA 19" Rack (1U<sup>4</sup>)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products  
**AMD® 8131 PCI-X Bridge Chip** providing two PCI-X bridges running at 100Mhz (bridge A for SCSI and Ethernet; bridge B for PCI-X expansion slots) / **8111 I/O HyperTransport Bridge Chip** supporting a 200 Mhz double-pumped HyperTransport clock (PCI, AC '97, Ethernet, SMBus, USB, 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 Rear ports *24X-10X<sup>5</sup> CD-ROM / IDE / Diskette and keyboard: none (USB diskette and keyboard optional); legacy not supported*  
 Front ports / graphics *Rear: two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported*  
 Console interconnects *Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2*  
**C2T Interconnect™** cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported

Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / Remote Supervisor Adapter II card not supported	Opteron 246 Processor Upgrade	13N0705
Diagnostics	Diagnostic LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported	Opteron 248 Processor Upgrade	13N0706
		Opteron 250 Processor Upgrade	13N0702
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	Opteron 252 Processor Upgrade	13N0703
		2GB PC2700 CL2.5 ECC DDR-SDRAM kit	73P2269
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director™, and others	1GB PC3200 CL3 ECC DDR-SDRAM kit	73P3233
		80GB SATA-150 7.2k HDD*	25R6902
Cooling fans	Eight fans (five for system, three inside power supply) / variable speed / not redundant or hot-swap	160GB SATA-150 7.2k HDD*	25R6903
		36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	32P0734
Power supply Prerequisites	411 watt / universal / auto-sensing / auto-restart support Monitor, keyboard, mouse, rack, disk (some), operating sys,	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 x 653.3mm
- 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- LSI Logic Configuration Utility: CTRL+C at startup
- Includes one line cord (9 ft universal interrack HV cable with IEC plug)
- Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

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

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

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

See footnotes for important warranty information

• = Hot-swap in some models

☛ = Models announced February 2005



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

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

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

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

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

**Memory** **1GB** std / 16GB max<sup>13</sup> / four slots enabled with uni-processor, eight with dual / two slots used / six slots available / **PC3200** registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Chipkill™** supported

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

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

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

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

**Mechanical Architecture/chipsets** **EIA 19" Rack (1U<sup>4</sup>)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products **ServerWorks HT2000 System I/O controller** connects to the processor sub-system via a 16x Hyper Transport Bus at 1GHz and provides PCI-E, PCI-X and Dual Gigabit Ethernet / **ServerWorks HT1000 South Bridge** interfaces system I/O to the HT2000 via a 8x Hyper Transport bus and provides PCI-X, SATA 2.0, USB 2.0, ATA 100 IDE, SMB, IOAPIC, Event Timer, Watchdog Timer, Interrupt controller and LPC1

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

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

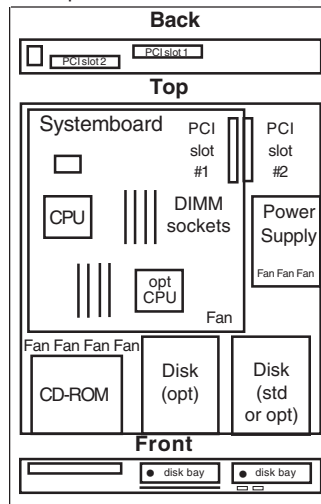
**Optical/diskette/kbd** 24X-10X<sup>6</sup> CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported

**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

<b>Systems mgmt</b>	Standard MS-9549 QLogic system management / IPMI 1.5 compliant / connector on planar / Remote Supervisor Adapter II optional	Opteron 252 Processor Upgrade Opteron 254 Processor Upgrade Opteron 265 Processor Upgrade Opteron 270 Processor Upgrade Opteron 275 Processor Upgrade Opteron 280 Processor Upgrade	13N0703 13N0704 25R8961 25R8960 25R8959 25R8966
<b>Diagnostics</b>	Diagnostic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported	1GB PC3200 CL3 ECC DDR-SDRAM kit 2GB PC3200 CL3 ECC DDR-SDRAM kit	73P3233 73P3234
<b>Security</b>	Power-on password / administrator password / Secure Power On/Off / unattended boot / selectable boot / unattended start mode / text console redirect via serial over LAN	80GB SATA-150 7.2k HDD 160GB SATA-150 7.2k HDD	25R6902 25R6903
<b>Software</b>	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director™, and others	73GB 15K Ultra320 SCSI Hot-Swap HDD 146GB 15K Ultra320 SCSI Hot-Swap HDD 146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 300GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1381 90P1382 90P1306 90P1307
<b>Cooling fans</b>	Eight fans (five for system, three inside power supply) / Calibrated Vector Cooling™ / variable speed / not redundant / not hot-swap	IBM TotalStorage FC2-133 Host Bus Adaptor IBM ServeRAID-6M SCSI (256MB Cache) USB Portable Diskette Drive	24P0960 02R0988 05K9276
<b>Power supply Prerequisites</b>	411 watt / universal / auto-sensing / auto-restart support Monitor, keyboard, mouse, rack, disk (some), os		



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

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

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

Maximum internal disk capacity<sup>13</sup> (model dependent):  
 600GB with two 300GB SL SCSI disks or  
 320GB with two 160GB SATA disks

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

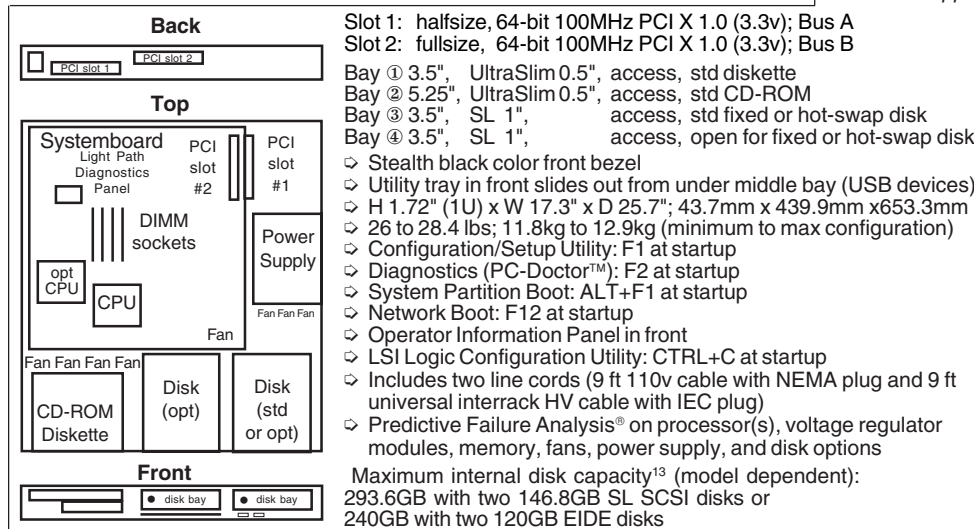
- 1 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 1 year IOR 9x5, 4 hr avg response (ServicePac® partnum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

IBM® Type-model	Qty x Processor	L2 cache	FSB MHz	Memory	Memory type	Disk	Disk controller	Hot-swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty <sup>3</sup>	Available date
8830-11X	1 x Xeon 2.8B GHz	512KB	533MHz	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	533MHz	512MB	Chipkill	40GB <sup>2</sup> EIDE	EIDE	2 fixed	2x4	2 x Gigabit	1 year	May 2003
8830-21X	1 x Xeon 3.06 GHz	512KB	533MHz	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	533MHz	512MB	Chipkill	40GB <sup>2</sup> EIDE	EIDE	2 fixed	2x4	2 x Gigabit	1 year	May 2003

Positioning	<i>A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments</i>											
Processor(s)	<b>1 x Intel® Xeon 2.8B or 3.06GHz<sup>1</sup></b> with 533MHz frontside bus / Hyper-Threading technology											
L2 cache	<b>512KB</b> / on die of processor / at processor speed (no L3 cache)											
SMP support	<b>2-way SMP</b> / 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	<b>512MB</b> std / 8GB max <sup>13</sup> / two slots used / two slots available / <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)											
SCSI disk controller	<i>All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector</i>											
IDE controller / cable	<i>All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM</i>											
Disk - capacity	<i>SCSI models: none standard / supports up to 15000 rpm disks; EIDE models: 40GB / 7200 rpm / ATA-100 / 8.7ms seek</i>											
Disk - bays	<i>SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all HD bays Ultra320-enabled</i>											
Mechanical Architecture / chipsets	<b>EIA 19" Rack (1U<sup>4</sup>)</b> / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products <b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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 <sup>6</sup> CD-ROM / IDE; <i>Diskette: 3.5" 1.44MB diskette drive / dust cover</i>											
Rear ports	<i>Rear: one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port</i>											
Front ports / graphics	<i>Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus</i>											
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)											
Systems mgmt	<b>IBM Integrated system management processor (ISMP)</b> / 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	<b>Light Path Diagnostics™</b> (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	<b>ServerGuide™</b> (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 2.8GHz/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 and 2 meter KVM chaining cable)	06P4792
NetBAY ACT Local Console Manager	1735L04

\* Disk not supported in all x335 systems



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

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

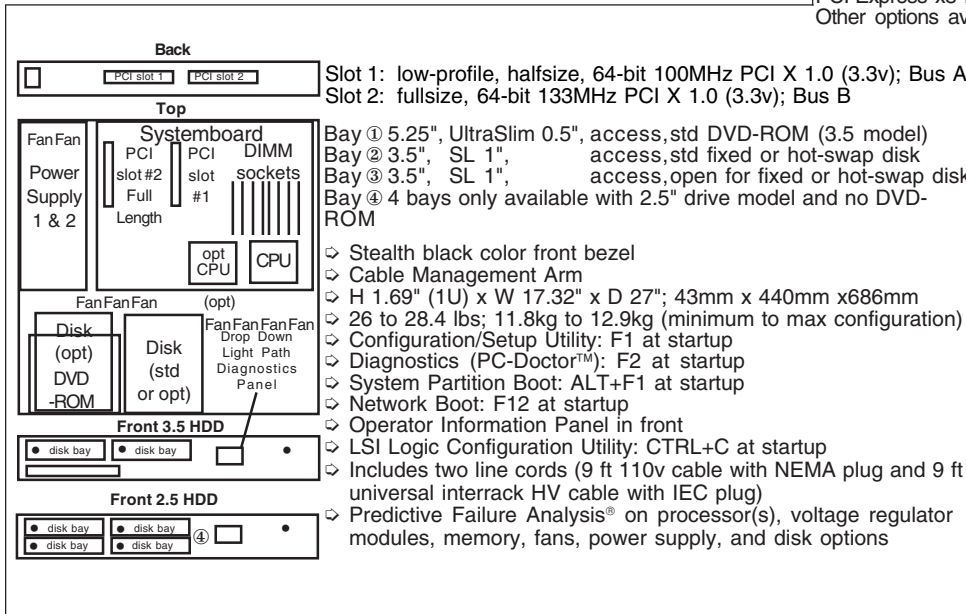
See footnotes for important warranty information (X335B) © IBM Corp. April 2003

• = Hot-swap in some models  
 <sup>1</sup> US models withdrawn effective March 2004  
 <sup>2</sup> 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	Disk bays	Slots x bays	Ethernet	Limited warranty <sup>3</sup>	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 / <b>Extended Memory 64 Technology (EM64T)</b>											
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 <sup>13</sup> / 8 slots (6 avail) / <b>PC2-3200</b> 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-conductor slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / <b>Active Memory™</b> : online spare and memory mirror / ability to support <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> ; 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 <b>RAID-1 mirroring</b> (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	<b>SCSI 3.5</b> : 292GB with two 146GB HDD <b>SCSI 2.5</b> : four 2.5" 73GB HDD <b>SATA</b> : 500GB with two 250GB HDD											
Disk - bays	<b>SCSI</b> : two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors <b>SATA</b> : 2 simple-swap											
Mechanical Architecture / chipsets	EIA 19" Rack (1U*) / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products Intel E7520 / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)											
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail											
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports											
DVD-ROM / diskette	<b>Some</b> : DVD-ROM / IDE; <b>Diskette</b> : none											
Rear ports	<b>Rear</b> : 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	<b>Drop down light path diagnostics</b> 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](http://www.ibm.com/pc/us/accessories)



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

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

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 <sup>3</sup>	Available date
8837-15y-15x	1 x Xeon® 3.0GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-1Vy-1Vx	1 x Xeon 3.0GHz	2MB	1GB	None (open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Mar 2005
8837-16y-16x	1 x Xeon 3.0GHz	2MB	1GB	None (open 3.5)	SATA	DVD	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Mar 2005
8837-25y-25x	1 x Xeon 3.2GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-35y-35x	1 x Xeon 3.4GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-3Vy-3Vx	1 x Xeon 3.4GHz	2MB	1GB	None (open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Mar 2005
8837-36y-36x	1 x Xeon 3.4GHz	2MB	1GB	None (open 3.5)	SATA	DVD	585W	2 simple-sp	2x3	2 x Gigabit	3 year	Mar 2005
8837-45y-45x	1 x Xeon 3.6GHz	2MB	1GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-E1y-E1x	1 x Xeon 3.0GHz	2MB	2GB	None (open 3.5)	Ultra320	DVD	585W	2 hot-swap	2x3	2 x Gigabit	3 year	Mar 2005
8837-E2y-E2x	1 x Xeon 3.0GHz	2MB	2GB	None (open 2.5)	Ultra320	None	585W	4 hot-swap	2x4	2 x Gigabit	3 year	Mar 2005

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

Memory **1GB** std / 16GB max<sup>13</sup> / 8 slots (6 avail) / **PC2-3200** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Active Memory™**: online spare and memory mirror / **Error Checking and Correcting (ECC)**

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

Mechanical Architecture / chipsets **EIA 19" Rack (1U<sup>4</sup>)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products  
**Intel E7520** / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)

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

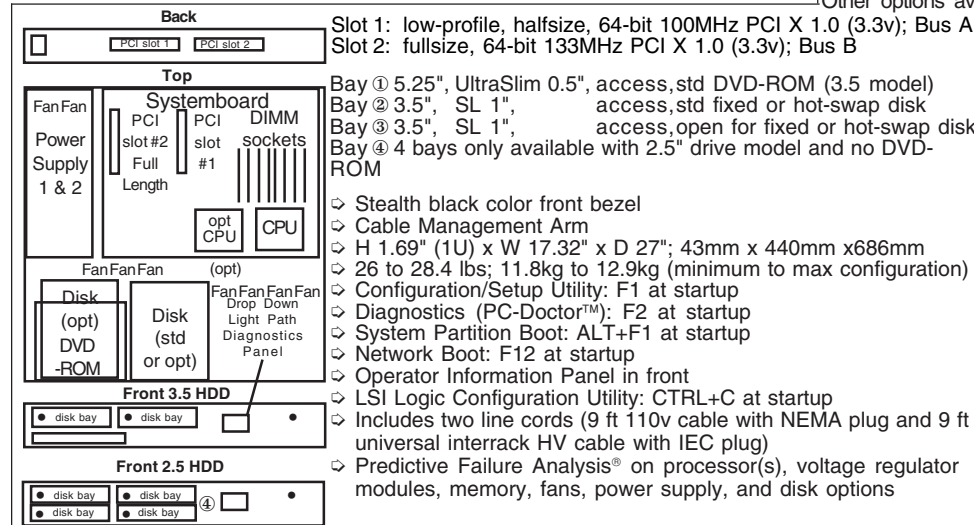
Systems mgmt **IBM Baseboard Management Controller (BMC)** / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr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

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

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

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

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



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

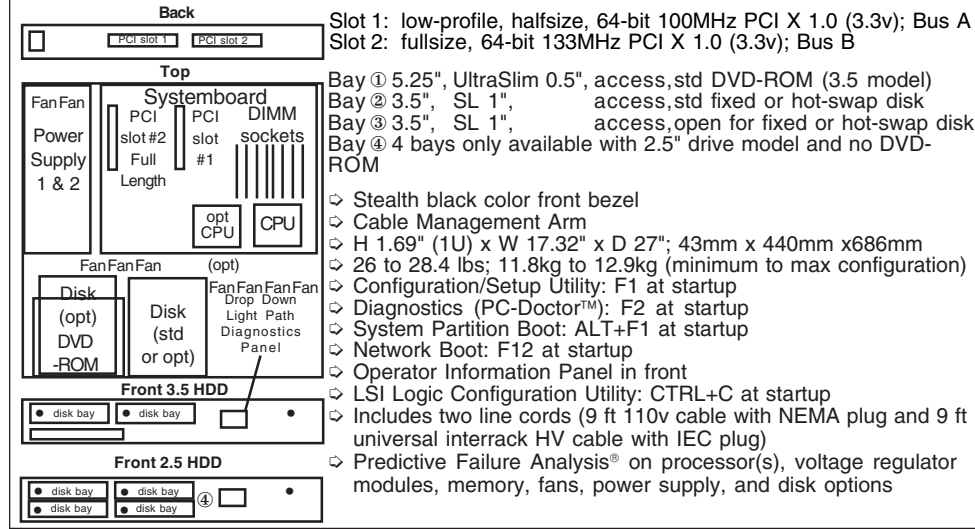
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® part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

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

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 <sup>3</sup>	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 Processor(s)	A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments <b>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</b>	
Cache SMP support Implementation	<b>2MB L2 Cache</b> std on Single Core / <b>2x2MB L2 Cache</b> std on Dual Core / on die of processor / at processor speed / ECC <b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, eight DIMM slots, two PCI-X slots (one full length 133MHz, one low-profile 100MHz) and integrated SCSI or SATA, dual GB ethernet, graphics	
Memory	<b>1GB</b> std / 16GB max <sup>13</sup> / 8 slots (6 avail) / <b>PC2-3200</b> 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 / <b>Active Memory™</b> : online spare and memory mirror / <b>Error Checking and Correcting (ECC)</b>	
SCSI disk controller	<b>LSI Logic® 53C1020 / Ultra320 SCSI controller</b> (LVD 320MB/sec) / on planar / supports <b>RAID-1 mirroring</b> (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / no external connector	
SATA disk Controller IDE controller / cable Disk - MAX capacity Disk - bays	Enhanced <b>SATA-150</b> (150MB/sec) controller / two connectors on planar / two one-drop cables one 1-drop EIDE cable to DVD-ROM <b>SCSI 3.5:</b> 292GB with two 146GB HDD <b>SCSI 2.5:</b> four 2.5" 73GB HDD <b>SATA:</b> 500GB with two 250GB HDD <b>SCSI:</b> two hot-swap or four 2.5" hot-swap / 80-pin SCA-2 connectors <b>SATA:</b> 2 simple-swap	
Mechanical Architecture / chipsets	<b>EIA 19" Rack (1U)</b> / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products <b>Intel E7520</b> / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)	
Bus slots Ethernet controllers	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports	
DVD-ROM / diskette Rear ports Graphics	<b>Some:</b> DVD-ROM / IDE; <b>Diskette:</b> none <b>Rear:</b> Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2 SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus	
Systems mgmt	<b>IBM Baseboard Management Controller (BMC)</b> / 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	<b>Drop down light path diagnostics</b> Pull out Front panel (LED lights indicate failing component)	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
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	512MB(2x256)PC2-3200CL3ECCDDR2RDIMM 73P3523 160GB 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
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director™, and others	ServeRAID 6i+ adaptor 13N2190 Remote Supervisor Adapter II slimline 73P9341 Second 585W Power supply 90P5280 PCI-Express x8 full-length riser card 22R9293
Cooling fans Power supply	<b>Calibrated Vectored Cooling™</b> / Std: seven fans; Max: nine / variable speed / hot-swap / redundant 585 watt hot-swap (second Opt) / universal / auto sensing / auto re-start	
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys	

Other options available at [www.ibm.com/po/us/accessories](http://www.ibm.com/po/us/accessories)



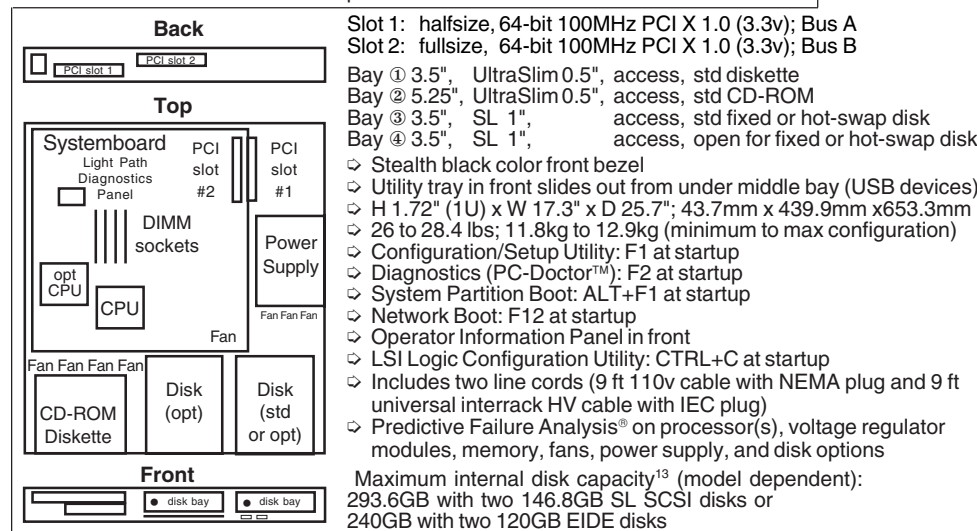
**LIMITED WARRANTY<sup>3</sup>**

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

IBM® 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 <sup>3</sup>	Available date
8676-1AX	1 x Xeon 2.8B GHz	512KB	533	512MB	Chipkill	None (open)	Ultra320	2 hot-swap	2x4	2 x Gigabit	3 year	Mar 2003

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

Positioning	<i>A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments</i>																																									
Processor(s)	<b>1 x Intel® Xeon 2.8BGHz<sup>1</sup></b> with 533MHz frontside bus / Hyper-Threading technology																																									
L2 cache	<b>512KB</b> / on die of processor / at processor speed (no L3 cache)																																									
SMP support	<b>2-way SMP</b> / 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	<b>512MB</b> std / 8GB max <sup>13</sup> / two slots used / two slots available / <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)																																									
SCSI disk controller	<i>All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller</i> (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports <b>RAID-1 mirroring</b> (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector																																									
IDE controller / cable	<i>All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM</i>																																									
Disk - capacity	<i>SCSI models: none standard / supports up to 15000 rpm disks; EIDE models: 40GB / 7200 rpm / ATA-100 / 8.7ms seek</i>																																									
Disk - bays	<i>SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / <b>all disk bays Ultra320-enabled</b></i>																																									
Mechanical Architecture / chipsets	<b>EIA 19" Rack (1U<sup>4</sup>)</b> / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products <b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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 <sup>6</sup> CD-ROM / IDE; <i>Diskette: 3.5" 1.44MB diskette drive / dust cover</i>																																									
Rear ports	<i>Rear: one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port</i>																																									
Front ports / graphics	<i>Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus</i>																																									
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)																																									
Systems mgmt	<b>IBM Integrated system management processor (ISMP) / H8S2148</b> / 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	<b>Light Path Diagnostics™</b> (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	<b>332 watt (-48 to -60 V dc [direct current])</b> / auto-sensing / supports dual input sources (two power sources) / not redundant / not hot-swap / auto-restart support																																									
Prerequisites	Monitor, keyb., mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5																																									
	<table border="0"> <thead> <tr> <th></th> <th style="text-align: center;"><b>OPTIONS</b></th> <th></th> </tr> </thead> <tbody> <tr> <td>Xeon 2.8BGHz/512KB L2 Cache Proc Upg</td> <td></td> <td>73P6382</td> </tr> <tr> <td>512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM</td> <td></td> <td>33L5038</td> </tr> <tr> <td>1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td></td> <td>33L5039</td> </tr> <tr> <td>2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM</td> <td></td> <td>33L5040</td> </tr> <tr> <td>36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD</td> <td></td> <td>06P5776</td> </tr> <tr> <td>Remote Supervisor Adapter</td> <td></td> <td>09N7585</td> </tr> <tr> <td>ServeRAID™-4Mx Ultra160 SCSI Adapter</td> <td></td> <td>06P5736</td> </tr> <tr> <td>Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)</td> <td></td> <td>06P4792</td> </tr> <tr> <td>NetBAY ACT Local Console Manager</td> <td></td> <td>1735L04</td> </tr> </tbody> </table>													<b>OPTIONS</b>		Xeon 2.8BGHz/512KB L2 Cache Proc Upg		73P6382	512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM		33L5038	1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM		33L5039	2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM		33L5040	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD		06P5776	Remote Supervisor Adapter		09N7585	ServeRAID™-4Mx Ultra160 SCSI Adapter		06P5736	Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)		06P4792	NetBAY ACT Local Console Manager		1735L04
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<b>LIMITED WARRANTY<sup>3</sup></b>	
↻	<b>3 year parts and labor</b>
↻	<b>International Warranty Service<sup>3</sup></b>
↻	<b>On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup></b>
↻	<b>On site service upgrade options (in eligible locations):<sup>7</sup></b>
•	<b>3 year IOR 9x5, 4 hr avg response</b> (ServicePac® part num 21P2072)
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•	<b>3 year IOR 24x7, 2 hr avg response</b> (ServicePac part num 21P2074)
•	<b>4 year IOR 24x7, 4 hr avg response</b> (ServicePac part num 69P9244)
•	<b>5 year IOR 9x5, NBD response</b> (ServicePac part num 69P9246)
↻	<b>Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></b>
↻	<b>24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></b>

See footnotes for important warranty information

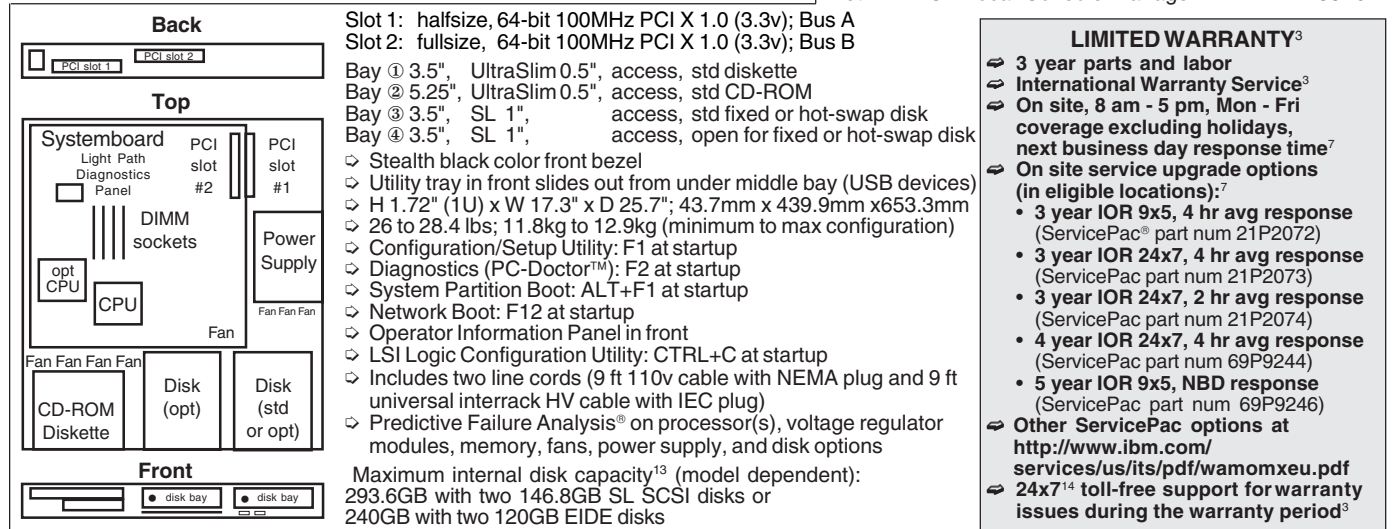
• = Hot-swap

® US models announced February 18, 2003

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

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

Positioning	<i>A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments</i>											
Processor(s)	<b>1 x Intel® Xeon 2.8BGHz<sup>1</sup></b> with 533MHz frontside bus / Hyper-Threading technology											
L2 cache	<b>512KB</b> / on die of processor / at processor speed (no L3 cache)											
SMP support	<b>2-way SMP</b> / 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	<b>512MB</b> std / 8GB max <sup>13</sup> / two slots used / two slots available / <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips). Chipkill available on DIMMs of 512MB or greater only.											
SCSI disk controller	<i>All (not used on EIDE models): LSI Logic® 53C1020 / Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports RAID-1 mirroring (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector</i>											
IDE controller / cable	<i>All: Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) EIDE models: One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM</i>											
Disk - capacity	<i>SCSI models: none standard / supports up to 15000 rpm disks; EIDE models: 40GB / 7200 rpm / ATA-100 / 8.7ms seek</i>											
Disk - bays	<i>SCSI models: two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled</i>											
Mechanical Architecture / chipsets	<b>EIA 19" Rack (1U<sup>4</sup>)</b> / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products <b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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 <sup>6</sup> CD-ROM / IDE; <i>Diskette: 3.5" 1.44MB diskette drive / dust cover</i>											
Rear ports	<i>Rear: one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port</i>											
Front ports / graphics	<i>Front: two USB (Vers 1.1); Graphics: SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus</i>											
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)											
Systems mgmt	<b>IBM Integrated system management processor (ISMP) / H8S2148</b> / 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	<b>Light Path Diagnostics™</b> (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	<b>ServerGuide™</b> (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	<b>332 watt (-48 to -60 V dc [direct current])</b> / 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											
	<b>OPTIONS</b>											
	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											




See footnotes for important warranty information

• = Hot-swap

US models announced January 20, 2004

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

<p>Slot 1: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B</p> <p>Slot 2: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B</p> <p>Slot 3: fullsize, 64-bit 33MHz PCI 2.2 (5v), Bus B</p> <p>Slot 4: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C</p> <p>Slot 5: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C</p> <p>Slot 6: low-profile, 64-bit 66MHz PCI 2.2 (3.3v), Bus C</p>	<p>➤ Raven black color (front bezel)</p> <p>➤ Configuration/Setup Utility invoked by pressing F2 at startup</p> <p>➤ SCSISelect near startup by pressing CTRL+A</p> <p>➤ PC-Doctor™ diagnostics on diskette</p> <p>➤ Several hardcopy publications</p> <p>➤ H 3.5" x W 17.5" x D 20.0"</p> <p>➤ H 89 mm x W 445 mm x D 508 mm</p> <p>➤ 34 to 37 pounds (15.4 to 16.8 kg)</p> <p>➤ IPMI 1.5 and WfM 2.0-compliant</p>	<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <p>↔ 1 year parts and labor</p> <p>↔ International Warranty Service<sup>3</sup></p> <p>↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup></p> <p>↔ 1 year on site warranty service upgrade options (in eligible locations):<sup>7</sup></p> <ul style="list-style-type: none"> <li>• 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (No ServicePac® part number)</li> <li>• 24 hr x 7 day coverage, 4 hour average response time (No ServicePac part number)</li> <li>• 24 hr x 7 day coverage, 2 hour average response time (No ServicePac part number)</li> </ul> <p>↔ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></p>
<p><b>2U Rack</b></p>  <p>Bay ① 3.5", 0.5", access, std diskette</p> <p>Bay ② 3.5", 0.5", access, std CD-ROM</p> <p>Bay ③ 3.5", SL 1", no access, std disk</p> <p>Bay ④ 3.5", SL 1", no access, optional disk</p>		
<p>All models: Max int disk capacity: 72.8GB<sup>2</sup> with two 36.4GB SL disks</p>		

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

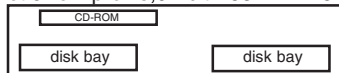


IBM® Type-model	Qty x Processor	L2 cache Memory	Ultra320 SCSI disk	SCSI controller	Mechanical	Slots x Disk bays	Disk Bays	Alarm Panel	Power supply	Compliant	Available date
8847-14X	2 x Pentium® Xeon 2.4GHz	512KB 1GB	1 x 73.4GB <sup>2</sup> 10K	2 x Ultra320	2U <sup>4</sup> rack	6x3	2 HS	Yes	DC power	NEBS-3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

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

Positioning	<i>Network Equipment Building System (NEBS) level 3-compliant for telecommunications carrier-grade environments</i>										
Processor(s)	<b>2 x Intel® Pentium® Xeon 2.4GHz with 533MHz frontside bus</b>										
L2 cache	<b>512KB</b> std and max / ECC / at processor speed / processor and L2 cache in Flip Chip Pin Grid Array (FC-PGA2)										
Implementation	Motherboard contains two Intel Socket 604 INT3/FCPGA, six DIMM sockets, two PCI riser connectors, and integrated SMP support										
SMP support	via second identical processor is standard										
Memory	<b>Up to 2GB std / 12GB<sup>13</sup> max / 266MHz SDRAM</b> / Six 168-pin sockets / Two sockets used / Four sockets available / ships with two 512 GB or 1GB DIMMs / <b>Error Checking and Correcting (ECC)</b> memory controller / matched pairs required / two-way interleaving / optional 2GB upgrade kit available by special bid										
SCSI disk controller	<b>Adaptec® AIC-7902W / dual channel Wide Ultra320 SCSI controller (LVD 320MB/sec)</b> / on planar / 64-bit PCI										
SCSI channels	<b>SCSI Channel A:</b> external 16-bit .8mm VHDCI 68-pin external connector (no cables) <b>SCSI Channel B:</b> one internal 16-bit 68-pin LVD cable from controller to two-bay disk drive carrier										
SCSI disk	<b>1 x 73.4GB or 146.8GB</b> Ultra320 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T. <sup>5</sup>										
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	<b>EIA 19" Rack (2U<sup>4</sup>) x 20-inch deep</b>										
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	<b>Intel® E7501 chipset</b> / 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 <sup>6</sup> 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	<b>External alarm panel</b> 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	<b>Operator Information Panel</b> (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)										
Systems mgmt	<b>Integrated service processor</b> (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /										
Diagnostics	LED diagnostics and on-board diagnostics providing an LED map to a failing component										
OS support	Microsoft Windows 2000, Windows 2003 Advanced Server / Red Hat AS 2.1 / SLES										
Software ship group	Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide)										
Keyboard / mouse	None (since rack-based)					2GB PC2100 DDR ECC RDIMM Memory Kit 73P4126					
Power supply	Std: one (14X) or two (24X); max: two / accessible from rear					Other options available via special Bid					
Fans	480 watt (-48 to -60 V dc [direct current]) / supports dual input sources (two power sources) / <b>redundant / hot-swap</b> / auto-restart support										
Prerequisites	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each Pentium III processor Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system										

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



**2U Rack**

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

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

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

- ⇨ 3/3 year parts and labor
- ⇨ International Warranty Service<sup>3</sup>
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇨ 2 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

All models: Max int disk capacity: 293.6GB<sup>2</sup> with two 146.8GB SL disks

See footnotes for important warranty information

US model announced June 15, 2004

⇨ Model withdrawn from marketing effective April 2005

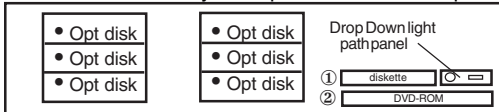
IBM® Type-GAV-model	Qty x Processor	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-01y-01U	1 x Xeon™ 2.8GHz	1MB	512MB	None	2 x Ultra320	2U <sup>4</sup>	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Aug 2004
8840-11y-11U	1 x Xeon 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 <sup>13</sup> 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 <sup>4</sup> ) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion									
Chipset	Intel E7520 / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Processor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O									
Bus slots	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots									
Ethernet controller	Two gigabit 10/100/1000 ethernet ports / Two Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear									
Optical / diskette	8X-24X <sup>6</sup> DVD-ROM / IDE; Diskette: 3.5" 1.44MB diskette drive / dust cover									
Front & Rear ports	Front: one USB (Vers 2.0) Rear: two USB (Vers 2.0), keyboard, mouse, serial (9-pin), graphics (DB-15), two ethernet (RJ-45), two RJ-45 (sys mgmt) / no parallel port									
Graphics	SVGA / ATI® Radeon™ 7000m / on planar / 16MB DDR SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Security	Power-on password / administrator password / unattended boot / selectable boot sequence									
Systems mgmt	IBM Baseboard Management Controller (BMC) / H8S2168 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter II slimline with reserved connector for continuous power (no ext power reqd)					Xeon 2.8GHz 800MHz/1MB L2 Proc Upg Xeon 3.0GHz 800MHz/1MB L2 Proc Upg Xeon 3.2GHz 800MHz/1MB L2 Proc Upg Xeon 3.4GHz 800MHz/1MB L2 Proc Upg Xeon 3.6GHz 800MHz/1MB L2 Proc Upg				
Diagnostics	Drop down light path diagnostics panel providing LED map to failing part (located on front panel)					512MB(2x256)PC2-3200 CL3 ECC DDR2 Non-Chkp Kit 73P3523 1GB(2x512)PC2-3200 CL3 ECC DDR2 Non-Chkp Kit 73P3522 2GB(2x1GB)PC2-3200 CL3 ECC DDR2-SDRAM 73P2866				
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others					IBM ServeRAID-7k Adapter 71P8642 IBM Remote Supervisor Adapter II Slim 73P9341 73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD 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				
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					Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>				
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack									

<p>Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X non hot, Bus A Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B* Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*</p> <p>*slots 3 &amp; 4 riser may be replaced with PCI-Express riser</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> </div> <p>Bay ① 3.5", 0.5", access, slim diskette Bay ② 5.25", 0.5", access, slim DVD-ROM Bay ③ 3.5", SL 1", access, hot-swap, open for disk Bay ④ 3.5", SL 1", access, hot-swap, open for disk Bay ⑤ 3.5", SL 1", access, hot-swap, open for disk Bay ⑥ 3.5", SL 1", access, hot-swap, open for disk Bay ⑦ 3.5", SL 1", access, hot-swap, open for disk Bay ⑧ 3.5", SL 1", access, hot-swap, open for disk Bays 3 through 8 support six SL disks; or 1 DDS5 Tape drive (2 slots used, additional PCI SCSI adaptor req) via SCA-2 connectors</p>	<p>Quick release adapter slots (no screws) Configuration/Setup Utility: F1 at startup Diagnostics (PC-Doctor™): F2 at startup System Partition Boot: ALT+F1 at startup Network Boot: F12 at startup Front indicators LEDs: Power-on LED, SCSI bus activity LED, system identification LED, information LED, and system-error LED Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm) 46.5 to 62 pounds Stealth black color</p>	<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <ul style="list-style-type: none"> <li>⇨ 3 year parts and labor</li> <li>⇨ International Warranty Service<sup>3</sup></li> <li>⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup></li> <li>⇨ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup> <ul style="list-style-type: none"> <li>• 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>®</sup> 21P2077)</li> <li>• 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)</li> <li>• 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)</li> </ul> </li> <li>⇨ Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></li> <li>⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></li> </ul>
<p>All models: Max int disk capacity: 880.0GB<sup>2</sup> with six 146.8GB SL disks</p>		

See footnotes for important warranty information

• = Hot-swap

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 <sup>4</sup>	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-16y-16U	1 x Xeon 3.0GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-25y-25U	1 x Xeon 3.2GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-35y-35U	1 x Xeon 3.4GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-36y-36U	1 x Xeon 3.4GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-45y-45U	1 x Xeon 3.6GHz	2MB 1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-E1y-E1U	1 x Xeon 3.0GHz	2MB 1GB	3x73.4GB	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
Positioning Processor	A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments <b>1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6GHz</b> with 800MHz frontside bus / <b>Optimized for Extended Memory 64 Technology (EM64T)</b> / Hyper-Threading technology / <b>Simultaneous multi-threaded (SMT)</b>								
L2 cache	<b>2MB</b> L2 Cache / on die of processor / at processor speed								
SMP support Implementation	<b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel PGA604 micro-PGA ZIF sockets, eight memory DIMM slots, two low-profile PCI-X (100MHz) slots, two full-length PCI-X (133MHz) slots, and integrated SCSI, dual GB ethernet, graphics								
Memory	<b>1GB</b> std / <b>16GB<sup>13</sup></b> max / two slots used / six slots available / DIMMs / <b>PC2-3200 DDR2</b> 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 / <b>Active Memory™</b> : Memory mirroring, hot-spare memory / <b>Error Checking and Correcting (ECC)</b> / optional <b>16-bit Checksum Chipkill™</b> 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	<b>Adaptec® AIC-7902 / dual channel Ultra320 SCSI controller</b> (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports <b>RAID-0 and 1</b> with up to one hot-spare disk / optional IBM ServeRAID™-7k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)								
SCSI channels	Two 16-bit channels (one internal and one external) / <i>SCSI Channel B</i> : 16-bit 68-pin LVD cable from systemboard to backplane for six disks; <i>Channel A</i> : 16-bit 68-pin interface to support external SCSI devices via external SCSI 0.8mm VHDCI connector / supports optional ServeRAID adapters with external connector(s) for external devices								
IDE controller/cable	Enhanced IDE ATA-100 controller in ICH5 South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)								
Disk - capacity	None standard / supports 7200-15000 rpm disks / one backplane								
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / filler panels installed in each disk bay / all disk bays Ultra320-enabled								
Mechanical Chipset	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel E7520</b> / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Processor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O								
Bus slots	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots								
Ethernet controller	Two gigabit 10/100/1000 ethernet ports / <b>Two Broadcom® 5721</b> / 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	<b>8X-24X<sup>6</sup></b> DVD-ROM / IDE; <i>Diskette</i> : 3.5" 1.44MB diskette drive / dust cover								
Front & Rear ports	<i>Front</i> : one USB (Vers 2.0) <i>Rear</i> : two USB (Vers 2.0), keyboard, mouse, serial (9-pin), graphics (DB-15), two ethernet (RJ-45), two RJ-45 (sys mgmt) / no parallel port								
Graphics	SVGA / ATI® Radeon™ 7000m / on planar / 16MB DDR SDRAM std/max / 32-bit 33MHz PCI 2.2 bus								
Security	Power-on password / administrator password / unattended boot / selectable boot sequence								
Systems mgmt	<b>IBM Baseboard Management Controller (BMC)</b> / H8S2168 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter II slimline with reserved connector for continuous power (no ext power reqd)								
Diagnostics	<b>Drop down light path diagnostics</b> panel providing LED map to failing part (located on front panel)								
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others								
Keyboard / mouse	None standard (because rack-based)								
Power supply	<i>Std/Max</i> : one/two 625 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing								
Fans	<b>Calibrated Vectored Cooling™</b> <i>Std</i> : six fans; <i>Max</i> : twelve (six fans with optional second power supply) / redundant with twelve fans installed; <i>All</i> : variable speed / hot-swap / PFA								
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack								
Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A	Quick release adapter slots (no screws)								
Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X non hot, Bus A	Configuration/Setup Utility: F1 at startup								
Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*	Diagnostics (PC-Doctor™): F2 at startup								
Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*	System Partition Boot: ALT+F1 at startup								
*slots 3 & 4 riser may be replaced with PCI-Express riser	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								
	<i>All models</i> : Max int disk capacity: 880.0GB <sup>2</sup> with six 146.8GB SL disks								
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									



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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>®</sup> 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

• = Hot-swap

IBM® Type-GAV-model	Qty x Processor/Core	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-05y-05U	1 x Xeon™ 2.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U <sup>4</sup>	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 Processor	A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments									
L2 cache SMP support Implementation	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 2MB L2 Cache std on Single Core / 2x2MB L2 Cache std on Dual Core / on die of processor / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size)									
Memory	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									
SCSI disk controller	1GB or 2GB std / 16GB <sup>13</sup> 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 channels	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)									
IDE controller/cable	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									
Disk - capacity	Enhanced IDE ATA-100 controller in ICH5 South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)									
Disk - bays	None standard / supports 7200-15000 rpm disks / one backplane									
Mechanical Chipset	Six hot-swap / 80-pin SCA-2 connectors / filler panels installed in each disk bay / all disk bays Ultra320-enabled									
Bus slots	EIA 19" Rack (2U <sup>4</sup> ) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel E7520 / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Processor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O									
Ethernet controller	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots									
Optical / diskette Front & Rear ports	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 8X-24X <sup>6</sup> DVD-ROM / IDE; Diskette: 3.5" 1.44MB diskette drive / dust cover									
Graphics	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									
Security	SVGA / ATI® Radeon™ 7000m / on planar / 16MB DDR SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	Power-on password / administrator password / unattended boot / selectable boot sequence									
Diagnosics	IBM Baseboard Management Controller (BMC) / H8S2168 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter II slimline with reserved connector for continuous power (no ext power reqd)					Xeon 2.8GHz SC 800MHz/2MB L2 Proc Upg 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				
Software	Drop down light path diagnostics panel providing LED map to failing part (located on front panel)					512MB(2x256)/PC2-3200 CL3 ECC DDR2 Non-Chkp Kit 73P3523 1GB(2x512)/PC2-3200 CL3 ECC DDR2 Non-Chkp Kit 73P3522 2GB(2x1GB)/PC2-3200 CL3 ECC DDR2-SDRAM 73P2866 4GB(2x2GB)/PC2-3200 CL3 ECC DDR2-SDRAM 73P4792				
Keyboard / mouse	None standard (because rack-based)					IBM ServeRAID-7k Adapter 71P8642				
Power supply	Std/Max: one/two 625 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing					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				
Fans	Calibrated Vectored Cooling™ Std: six fans; Max: twelve (six fans with optional second power supply) / redundant with twelve fans installed; All: variable speed / hot-swap / PFA					Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>				
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack									

Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A ⇨ Quick release adapter slots (no screws)

Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X non hot, Bus A ⇨ Configuration/Setup Utility: F1 at startup

Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B\* ⇨ Diagnostics (PC-Doctor™): F2 at startup

Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B\* ⇨ System Partition Boot: ALT+F1 at startup

\*slots 3 & 4 riser may be replaced with PCI-Express riser

• Opt disk	• Opt disk	Drop Down light path panel
• Opt disk	• Opt disk	
• Opt disk	• Opt disk	① diskette
		② DVD-ROM

**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

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

- ⇨ 3 year parts and labor
- ⇨ International Warranty Service<sup>3</sup>
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇨ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>®</sup> 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

All models: Max int disk capacity: 880.0GB<sup>2</sup> with six 146.8GB SL disks

See footnotes for important warranty information

• = Hot-swap

IBM® Type-model	Qty x Processor	L3 cache	Memory	Disks	SCSI controller	Mechanical	Slots x bays	RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8686-1RQ	1 x Xeon™ MP 2.0GHz	1MB	1GB Chipkill™	None	Ultra160	3U <sup>4</sup> rack	6x5	One	One (not redund)	PCI	Jun 2003
8686-1SQ	2 x Xeon MP 2.0GHz	1MB	1GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Nov 2003
8686-1TQ	2 x Xeon MP 2.0GHz	1MB	3GB Chipkill 2 x 36.4GB	10K	Ultra160	3U rack	6x5	One	Two redundant	PCI	Nov 2003
8686-2RQ	2 x Xeon MP 2.5GHz	1MB	2GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Jun 2003
8686-3RQ	2 x Xeon MP 2.8GHz	2MB	2GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Jun 2003
Processors	1 or 2 x Intel® Xeon™ Processor MP 2.0, 2.5, or 2.8GHz <sup>1</sup> with 400MHz frontside bus / Hyper-Threading technology										
L2 cache	512KB / on die of processor / at processor speed										
L3 cache	1MB or 2MB / on die of processor / at processor speed										
Processor upgrade Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI-X slots, and integrated SCSI, ethernet, graphics										
Memory	Up to 3GB std / 16GB max <sup>12,13</sup> / 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 / <b>Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™</b> (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 <sup>4</sup> ) 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 <sup>10</sup> available with power and attention indicator lights (optical sensors control power to slot) / <b>hot replace, hot upgrade, hot expansion</b> / 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 <sup>6</sup> CD-ROM / 3.5" 1.44MB diskette drive										
Ethernet	Intel 82559 10/100 ethernet controller / on systemboard / full duplex / 32-bit PCI / Wake on LAN® / Alert on LAN™ 2										
Graphics controller	SVGA / S3® Savage4 LT / on systemboard / 8MB SDRAM std/max / up to 1280x1024 at 64K colors at 85Hz										
Ports	Rear: RXE-100 Expansion Port (to connect optional RXE-100), RXE Management Port (to manage optional RXE-100), two USB (Ver 1.1), keyboard, mouse, analog DB-15 graphics, ethernet / no serial or parallel ports / Front: one USB (Ver 1.1)										
Security	Power-on and administrator passwords / unattended boot / selectable boot										
Systems management	Remote Supervisor Adapter / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies										
Diagnostics	Light Path Diagnostics™ / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running										
Software	ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, and others										
Keyboard / mouse	None standard (because rack-based)										
Power supplies	Std: one or two 370 watt hot-swap; Max: three hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA										
Cooling fans	Six hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor										
Six available 3.3 volt Active PCI-X slots:											
<ul style="list-style-type: none"> <li>• Bus 2 (B) with two slots supports (slots 1, 2): <ul style="list-style-type: none"> <li>- one fullsize, 64-bit, 133MHz PCI-X, hot-swap</li> <li>- or two fullsize, 64-bit, 100MHz PCI-X, hot-swap</li> <li>- or two fullsize, 64-bit, 66MHz PCI-X, hot-swap</li> <li>- or two fullsize, 64-bit, 66MHz PCI, hot-swap</li> <li>- or two fullsize, 64-bit, 33MHz PCI, hot-swap</li> </ul> </li> <li>• Bus 1 (A) with four slots supports (slots 3, 4, 5, 6): <ul style="list-style-type: none"> <li>- four fullsize, 64-bit, 66MHz PCI-X, hot-swap</li> <li>- or two fullsize, 64-bit, 66MHz PCI, hot-swap</li> <li>- or four fullsize, 64-bit, 33MHz PCI, hot-swap</li> </ul> </li> <li>• Bus 0 with one slot supports: <ul style="list-style-type: none"> <li>- only for standard Remote Supervisor Adapter halfsize, 64-bit, 33MHz PCI, not hot-swap</li> </ul> </li> </ul>											
<ul style="list-style-type: none"> <li>◇ Dimensions: H5.25" x W17.4" x D27.6"</li> <li>◇ Dimensions: H133.4mm x W442.0mm x D701mm</li> <li>◇ Weight: 58.4 to 70lbs; 24.9 to 31.8kg</li> <li>◇ Stealth black color</li> <li>◇ Tool-free serviceability</li> <li>◇ Access adapters, processors, memory, and systemboard from top</li> <li>◇ Access power supplies and disks from front</li> <li>◇ Setup Program by pressing F1 at startup</li> <li>◇ Diagnostics (PC-Doctor) by pressing F2 at startup</li> <li>◇ SCSISelect by pressing Ctrl+A at startup</li> <li>◇ Top cover Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover</li> <li>◇ Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being</li> <li>◇ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director</li> </ul>											
<p style="text-align: center;"><b>3U Rack</b></p>											
<p>Bay ① 3.5", 0.5", access, diskette                  Bay ② 3.5", 0.5", access, CD-ROM                  Bay ③ 3.5", SL 1", access, hot-swap                  Bay ④ 3.5", SL 1", access, hot-swap                  Bay ⑤ 3.5", SL 1", access, hot-swap</p>											
<p><b>All models:</b> Maximum internal disk capacity: 220.2GB with three 73.4GB<sup>2</sup> hot-swap SCSI disks</p>											
<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <ul style="list-style-type: none"> <li>⇐ 3 year parts and labor</li> <li>⇐ International Warranty Service<sup>3</sup></li> <li>⇐ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup></li> <li>⇐ On site service upgrade options (in eligible locations):<sup>7</sup> <ul style="list-style-type: none"> <li>• 3 year IOR 24x7, 4 hr avg response (ServicePac® part num 96P2253)</li> <li>• 3 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2254)</li> <li>• 4 year IOR 9x5, NBD response (ServicePac part num 96P2255)</li> <li>• 5 year IOR 9x5, NBD response (ServicePac part num 96P2259)</li> </ul> </li> <li>⇐ Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></li> <li>⇐ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></li> </ul>											

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

IBM® Type-model	Qty x Processor	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 <sup>4</sup> rack	6x8	One	One (not redund)	1	Dec 2003					
8862-1RX	1 x Xeon MP 2.0GHz	1MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	One (not redund)	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 <sup>1</sup> with 400MHz frontside bus / Hyper-Threading technology																
L2 cache	512KB / on die of processor / at processor speed																
L3 cache	1MB or 2MB / on die of processor / at processor speed																
Processor upgrade Implementation	4-way SMP / up to four Xeon Processors MP (same speed/cache size) Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI/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 / <b>Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™</b> / With 16 DIMMs installed: <b>Memory ProteXion™</b> (redundant bit steering) and <b>Active Memory™</b> supporting <b>Memory Mirroring™</b> (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	<b>EIA 19" rack models (3U<sup>4</sup>)</b> x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)																
Chipset	<b>IBM XA-32™ chipset</b> / 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 <sup>10</sup> available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers/bv																
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 <sup>6</sup> 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	<b>Remote Supervisor Adapter II</b> / 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	<b>Light Path Diagnostics™</b> / 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	<b>ServerGuide™</b> (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																
<p>Six available 3.3 volt PCI/PCI-X slots:</p> <ul style="list-style-type: none"> <li>• Buses 0-5 supports slots 1 - 6: <ul style="list-style-type: none"> <li>- one fullsize, 64-bit, 33MHz PCI, hot-swap Standard Remote Supervisor Adapter installed</li> <li>- one fullsize, 64-bit, 100MHz PCI-X, hot-swap Optional ServeRAID adapter to install</li> <li>- one fullsize, 64-bit, 133MHz PCI-X, hot-swap Optional iSeries IXA adapter to install</li> <li>- three fullsize, 64-bit, 133MHz PCI-X, hot-swap</li> </ul> </li> <li>◊ Dimensions: H5.25" x W17.4" x D27.6"</li> <li>◊ Dimensions: H133.4mm x W442.0mm x D701mm</li> <li>◊ Weight: 63 to 83lbs; 28.6 to 37.6kg</li> <li>◊ Stealth black color</li> <li>◊ Tool-free serviceability</li> <li>◊ Access adapters, processors, memory, and systemboard from top</li> <li>◊ Access power supplies and disks from front</li> <li>◊ Setup Program by pressing F1 at startup</li> <li>◊ Diagnostics (PC-Doctor) by pressing F2 at startup</li> <li>◊ SCSISelect by pressing Ctrl+A at startup</li> <li>◊ Top cover Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover</li> <li>◊ Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being</li> <li>◊ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director</li> </ul>																	
<table border="1"> <tr> <td>CD-ROM</td> <td>diskette</td> </tr> <tr> <td>• Opt disk</td> <td>• Opt disk</td> </tr> <tr> <td>• Opt disk</td> <td>• Opt disk</td> </tr> </table> <p><b>3U Rack</b></p> <p>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</p>												CD-ROM	diskette	• Opt disk	• Opt disk	• Opt disk	• Opt disk
CD-ROM	diskette																
• Opt disk	• Opt disk																
• Opt disk	• Opt disk																
<p><b>512MB PC2100 ECC DDR SDRAM RDIMM</b> 33L5038  <b>1GB PC2100 ECC DDR SDRAM RDIMM</b> 73P2031  <b>2GB PC2100 ECC DDR SDRAM RDIMM<sup>12</sup></b> 33L5041  <b>IBM x365Memory Upgrade Card</b> 73P9710  <b>Xeon MP 2.0GHz/1MB L3 Cache Proc Upg</b> 73P7073  <b>Xeon MP 2.5GHz/1MB L3 Cache Proc Upg</b> 73P7074  <b>Xeon MP 2.8GHz/2MB L3 Cache Proc Upg</b> 73P7075  <b>950 watt Hot-Swap Power Supply (WW)</b> 73P7214  <b>IBM ServeRAID™-4Mx Ultra160 SCSI Adapter</b> 06P5736  <b>IBM 73.4GB 15K Ultra320 SCSI Hot-Swap</b> 32P0735  <b>IBM Integrated xSeries Adapter for iSeries</b> 1519100  <b>IBM T541 15" Flat Panel Color Monitor (black)</b> 9512AB1  <b>RXE-100 Remote Expansion Enclosure</b> 86841RX  Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a></p>																	
<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <ul style="list-style-type: none"> <li>↔ 1 or 3 year parts and labor</li> <li>↔ International Warranty Service<sup>3</sup></li> <li>↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup></li> <li>↔ On site service upgrade options (in eligible locations):<sup>7</sup> <ul style="list-style-type: none"> <li>• 3 year IOR 24x7, 4 hr avg response ( 30L9186 (8861) / 96P2253 (8862) )</li> <li>• 3 year IOR 24x7, 2 hr avg response ( 31L2722 (8861) / 96P2254 (8862) )</li> <li>• 4 year IOR 9x5, NBD response ( 69P9210 (8661) / 96P2255 (8862) )</li> <li>• 5 year IOR 9x5, NBD response ( 69P9214 (8661) / 69P2259 (8862) )</li> </ul> </li> <li>↔ Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></li> <li>↔ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></li> </ul>																	
<p><b>All models:</b> Maximum internal disk capacity: 878.4GB with six 146.8GB<sup>2</sup> hot-swap SCSI disks</p>																	

See footnotes for important warranty information  
US models announced December 9, 2003

• = Hot-swap  
↔ US models withdrawn effective May 28, 2004 (8662-2RX, 3RX)

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
8861-4RX	1 x Xeon™ MP 2.2GHz	2MB	1GB Chipkill™	8	None	Ultra320	3U <sup>4</sup> rack	6x8	One	One (not redund)	1	Mar 2004
8862-4RX	1 x Xeon MP 2.2GHz	2MB	2GB Chipkill	8	None	Ultra320	3U rack	6x8	One	One (not redund)	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<sup>1</sup>** 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 Implementation **4-way SMP** / up to four Xeon Processors MP (same speed/cache size)  
 Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI/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<sup>4</sup>) 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<sup>10</sup> 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<sup>6</sup> 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

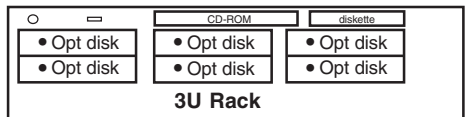
Software **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, and others

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 <sup>12</sup>	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 <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>	

- 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, 133MHz PCI-X, hot-swap



- 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<sup>2</sup> hot-swap SCSI disks

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

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

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

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

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

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

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

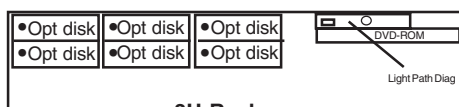
**Systems management** Remote Supervisor Adapter II Slimline (option) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies

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

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

<b>Keyboard / mouse</b>	None standard (because rack-based)	2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	73P2866
<b>Power supplies</b>	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	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 <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>	

Six available 3.3 volt PCI-X 2.0 slots:  
 Slot 1 - fullsize, 64-bit, 266MHz PCI-X, hot-swap  
 Slot 2 - fullsize, 64-bit, 266MHz PCI-X, hot-swap  
 Slot 3 - fullsize, 64-bit, 266MHz PCI-X, hot-swap  
 Slot 4 - fullsize, 64-bit, 266MHz PCI-X, hot-swap  
 Slot 5 - fullsize, 64-bit, 266MHz PCI-X, hot-swap  
 Slot 6 - fullsize, 64-bit, 266MHz PCI-X, hot-swap  
 \*exclusive slot available for ServeRAID 8i adapter



**3U Rack**

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

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

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

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

- ⇐ 3 year parts and labor
- ⇐ International Warranty Service<sup>3</sup>
- ⇐ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇐ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>



**IBM eServer™ 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	Mechanical	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 <sup>4</sup> 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 Processors **Up to 8-way (16-way two chassis) power for high-end databases, server consolidation and mission-critical business applications**  
**2 or 4 Intel® Xeon™ Processor DP or MP 2.0GHz - 3.0GHz<sup>1</sup>** 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 XcE<sup>4</sup>™ 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 Expansion 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<sup>13</sup>** (up to **64GB** per chassis using optional SMP Expansion Module) / four 512MB DIMMs installed / 16 DIMM gold-connector slots / must install two identical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / **Error Checking and Correcting (ECC)** and **Chipkill™** via **Memory ProteXion™** (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / **Active Memory™** supporting **hot-swap** and **hot-add** (OS specific) and **Memory Mirroring™** (non-OS specific)

SCSI 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<sup>4</sup>)** 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<sup>10</sup> 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<sup>6</sup> DVD-ROM / 3.5" 1.44MB** diskette drive / both removable from Ultrabay 2000 bays / supports CD-RW, DVD  
 Ethernet **Dual Broadcom<sup>8</sup> 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	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director, and others	xSeries SMP Expansion Module 1GB DDR PC2100 ECC SDRAM RDIMM 2GB DDR PC2100 ECC SDRAM RDIMM Xeon MP 2.2GHz/2MB L3 Cache Proc Upg Xeon MP 2.7GHz/2MB L3 Cache Proc Upg Xeon MP 3.0GHz/4MB L3 Cache Proc Upg IBM 73.4GB 10K Ultra160 SCSI Hot-Swap IBM ServeRAID™-6M Ultra320 SCSI Adapter IBM Remote Supervisor Adapter II-EXA NetBAY11 Standard Rack Cabinet 8X/4X/24X Max CD-RW Ultrabay 2000 IBM T540 15" Flat Panel Color Monitor (black) Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>	02R1870 33L5039 33L5040 13N0723 13N0722 13N0721 06P5756 32P0033 13N0382 9306110 22P9101 9511AG4
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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

Six available 3.3 volt Active PCI-X slots:

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



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

- ⊖ Dimensions: H7.0" x W19.0" x D27.5"
- ⊖ Dimensions: H178mm x W483mm x D699mm
- ⊖ Max weight: 110 lbs; 50kg
- ⊖ Stealth black color
- ⊖ Tool-free serviceability
- ⊖ Access processors, memory, adapters, and SMP Expansion Module from top
- ⊖ Access power supplies and disks from front
- ⊖ Setup Program by pressing F1 at startup
- ⊖ Diagnostics (PC-Doctor) by pressing F2 at startup
- ⊖ SCSISelect by pressing Ctrl+A at startup
- ⊖ Information LED panel and front-accessible pull-out Light Path panel (1st and 2nd level diagnostics without removing cover)
- ⊖ Predictive Failure Analysis® alerts on processors, XcE<sup>4</sup> 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<sup>2</sup> hot-swap SCSI disks

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

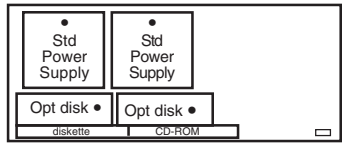
- ⇒ 3 year parts and labor
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 9 hr x 5 day coverage, next day response time<sup>7</sup>
- ⇒ 3 year on site warranty service upgrade option (in eligible locations):<sup>7</sup>
  - 24 hr x 7 day coverage, 2 hour response time (No ServicePac available)
- ⇒ Post warranty maintenance services available
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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

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

Positioning Processors	Up to 8-way (16-way two chassis) power for high-end databases, server consolidation and mission-critical business applications											
L3 cache	2 x Intel® Xeon™ Processor MP 2.2, 2.7, or 3.0GHz <sup>1</sup> with 400MHz frontside bus / supports Hyper-Threading											
L4 cache	2MB or 4MB each processor / on die of processor / at processor speed											
Processor upgrade	64MB XceL4™ Server Accelerator Cache (up to 128MB with optional SMP Expansion Module) / 64MB in each SMP Expansion Module / ECC / 64-bit 400MHz bus from Cache and Scalability Controller											
SMP Expansion Module	SMP Expansion Module standard / ready for adding additional processors (up to 8 total) and memory											
Additional boards	One SMP Expansion Module std / two max / each contains four Intel 603-pin micro-PGA ZIF sockets for Xeon MP, 64MB L4 cache, sixteen DIMM sockets, three SMP Expansion Ports (second module connected via one or two SMP Expansion Ports) / each SMP Expansion Module activates one RXE Expansion Port (one RXE Expansion Port supported)											
Memory	One I/O Board (PCI-X Host Bridge, SCSI, ethernet, graphics, South Bridge, Super I/O, slot for Mgmt Adapter), one PCI Board (PCI-X Host Bridge, six PCI-X slots), one Midplane Board (connects SMP Exp Modules, I/O Board, PCI Board)											
Memory	0GB std / 64GB max <sup>13</sup> (uses standard SMP Expansion Module) / no DIMMs installed / 32 DIMM gold-connector slots / must install two identical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / Error Checking and Correcting (ECC) and Chipkill™ via Memory ProteXion™ (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / Active Memory™ supporting hot-swap and hot-add (OS specific) and Memory Mirroring™ (non-OS specific)											
SCSI 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 <sup>4</sup> ) 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 <sup>10</sup> 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 <sup>6</sup> 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											

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<sup>2</sup> hot-swap SCSI disks

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

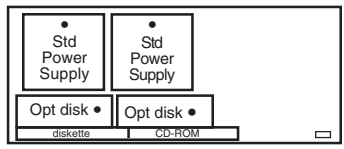
- ↻ 3 year parts and labor
- ↻ International Warranty Service<sup>3</sup>
- ↻ On site, 9 hr x 5 day coverage, next day response time<sup>7</sup>
- ↻ 1 year on site warranty service upgrade option (in eligible locations):<sup>7</sup>
  - 24 hr x 7 day coverage, 2 hour response time (No ServicePac available)
- ↻ Post warranty maintenance services available
- ↻ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↻ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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

IBM® Type-model	Qty x Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mechanical	Slots x bays	SMP/RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8855-4BY	4 x Itanium 2™ 1.5Ghz	4MB	64MB	2GB Chipkill™	None	2 x Ultra320	4U <sup>4</sup> 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	<i>Up to 16-way power for high-end databases, server consolidation and mission-critical business applications</i>											
Processors	<b>4 x Intel® Itanium 2™ Processor 1.5GHz or 1.6GHz</b> with 400MHz frontside bus											
L2 cache	<b>256KB</b> each processor / on die of processor / at processor speed											
L3 cache	<b>4MB, 6MB or 9MB</b> each processor / on die of processor / at processor speed											
L4 cache	<b>64MB Xcel4™ Server Accelerator Cache</b>											
Processor upgrade	ECC / 64-bit 400MHz bus from Cache and Scalability Controller											
SMP Exp. Module	<b>4-way SMP</b> per chassis											
Additional boards	<b>Up to 16-way</b> using four x455 chassis / requires appropriate 8-way or 16-way kits											
Memory	One I/O Board (PCI-X Host Bridge, SCSI, ethernet, graphics, South Bridge, Super I/O, slot for Mgmt Adapter), one PCI Board (PCI-X Host Bridge, six PCI-X slots), one Midplane Board (connects SMP Exp Modules, I/O Board, PCI Board)											
SCSI disk controller	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	<b>EIA 19" rack models (4U<sup>4</sup>)</b> x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)											
Chipset	<b>IBM XA-64™ chipset</b> / 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)	<b>Six hot-swap PCI-X 1.0 slots<sup>10</sup></b> available with power and attention indicator lights (optical sensors control power to slot) / <b>hot replace, hot upgrade, hot expansion</b> / 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 <b>RIO sharing</b> as each server will access six additional PCI-X slots.											
CD-ROM / diskette	24X/10X/24X/8X <sup>6</sup> 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	<i>Rear:</i> 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 / <i>no keyboard or mouse</i> / <i>Front:</i> one USB (Vers 1.1)											
Security	Power-on and administrator passwords / unattended boot / selectable boot											
Systems mgmt	<b>Remote Supervisor Adapter</b> / 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	<b>Light Path Diagnostics™</b> / 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	<b>ServerGuide™</b> (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											

<p>Six available 3.3 volt Active PCI-X slots:</p> <p>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</p>	<ul style="list-style-type: none"> <li>⊞ Dimensions: H6.9" x W17.3" x D28.1"</li> <li>⊞ Dimensions: H175mm x W440mm x D713mm</li> <li>⊞ Max weight: 120 lbs; 54.30kg</li> <li>⊞ Stealth black color</li> <li>⊞ Tool-free serviceability</li> <li>⊞ Access processors, memory, adapters, and SMP Expansion Module from top</li> <li>⊞ Access power supplies and disks from front</li> <li>⊞ Setup Program by pressing F1 at startup</li> <li>⊞ Diagnostics (PC-Doctor) by pressing F2 at startup</li> <li>⊞ SCSISelect by pressing Ctrl+A at startup</li> <li>⊞ Information LED panel and front-accessible pull-out Light Path panel (1st and 2nd level diagnostics without removing cover)</li> <li>⊞ Predictive Failure Analysis® alerts on processors, Xcel4 Server Accelerator Cache, memory, fans, power supplies, and optional disks with IBM Director</li> </ul>	<p><b>LIMITED WARRANTY<sup>3</sup></b></p> <ul style="list-style-type: none"> <li>⊞ 3 year parts and labor</li> <li>⊞ International Warranty Service<sup>3</sup></li> <li>⊞ IBM On Site (IOR), 9-5 Next-Business-Day coverage<sup>7</sup></li> <li>⊞ 3 year on site warranty service upgrade option (in eligible locations):<sup>7</sup> <ul style="list-style-type: none"> <li>• 24 hr x 7 day coverage, 2 hour response time 96P2689</li> </ul> </li> <li>⊞ Post warranty maintenance services available</li> <li>⊞ Other ServicePac options at <a href="http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf">http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf</a></li> <li>⊞ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup></li> </ul>
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- Bay ① 3.5", 0.5", access, open (Ultrabay 2000)
- Bay ② 3.5", 0.5", access, Combo (Ultrabay 2000)
- Bay ③ 3.5", SL 1", access, hot-swap
- Bay ④ 3.5", SL 1", access, hot-swap

**All models:** Maximum internal disk capacity: 293.6GB with two 146.8GB<sup>2</sup> hot-swap SCSI disks

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 <sup>4</sup> 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<sup>1</sup> 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<sup>4</sup>) 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<sup>6</sup> Slim DVD-ROM / none  
**Ethernet** Broadcom® 5704 10/100/1000 dual ethernet per chassis / on systemboard / 64-bit 266MHz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2

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

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

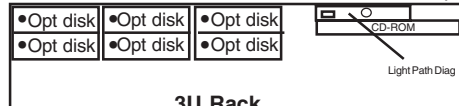
**Diagnostics** Drop down Light Path Diagnostics / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director)

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

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

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

- 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](http://ibm.com/pc/us/accessories)



**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

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

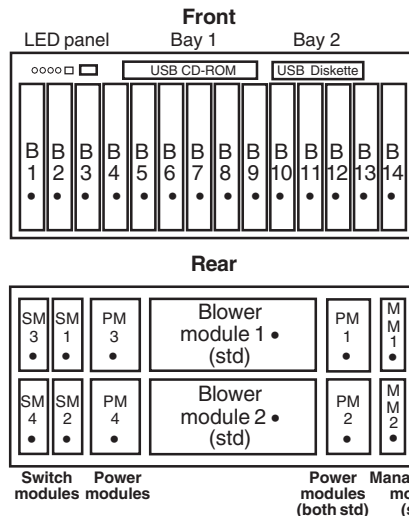
Dimensions: H5.05" x W17.32" x D28.15"  
 Dimensions: H128.35mm x W440.0mm x D715mm  
 Weight: 70 to 85lbs; 31.75 to 38.5kg  
 Stealth black color  
 Tool-free serviceability  
 Access adapters, power supplies, processors, memory and systemboard from top  
 Setup Program by pressing F1 at startup  
 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<sup>2</sup> hot-swap SAS disks

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

- ⇐ 3 year parts and labor
- ⇐ International Warranty Service<sup>3</sup>
- ⇐ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇐ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 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<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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	Mechanical	Available date
8677-1XX	8678 / 8832 HS20	0 / 14	0 / 4	Ethernet, Fibre Channel	1 / 1	2 / 4	1200W	2 / 2	7U <sup>4</sup> rack	Nov 2002
8677-2XX	All: HS20 / HS40*	0 / 14	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	1800W	2 / 2	7U <sup>4</sup> rack	Oct 2003
8677-3XX	All: HS20 / HS40	0 / 14	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	2000W	2 / 2	7U <sup>4</sup> rack	Oct 2004
Positioning Description	<i>Flexible, innovative design provides investment protection and reduces deployment costs</i> 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	<i>Std: none; max: four / hot-swap / rear access</i> 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									
Ethernet 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									
Fibre Channel Switch Module										
Management modules	<i>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</i>									
Power modules	<i>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)</i>									
Blower modules	<i>Std: two; max: two / hot-swap / redundant / variable speed / rear access / 325 cubic ft per min (CFM) / front to back airflow</i>									
Mechanical CD / diskette / USB	<b>EIA 19" rack models (7U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 ER, NetBAY42 SR)</b> 1XX/2XX: 24X-10X <sup>6</sup> CD-ROM 3XX: 8X-24X <sup>6</sup> 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	<i>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)</i>									
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 FAST1700 Fibre Channel Storage Server								17421RU
NetBAY42 Standard Rack Cabinet	9306420	IBM T541 15" Flat Panel Color Monitor (black)								9512AB1
NetBAY25 Standard Rack Cabinet	9306250	<ul style="list-style-type: none"> <li>• Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a></li> <li>• Solutions available from IBM BladeCenter Alliance program partners</li> </ul>								
APC Smart-UPS 5000RMB	37L6861									



- 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<sup>3</sup>**

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

See footnotes for important warranty information • = Hot-swap  
US models announced September 24, 2002 (1XX) or October 14, 2003 (2XX)

8677-3XX US models withdrawn effective December 30, 2003 (1XX). 1200W Power module withdrawn effective February 24, 2004

IBM® Type-model	Qty x Processor <sup>1</sup>	Speed/Core	L2 Memory Cache	Disk controller	Disk bays	SCSI support	Slots x bays	Mechanical	Required chassis	Available date
8850-51U	1 x Opteron 246	2.0 GHz/SC	1GB 1MB	0MB SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U <sup>4</sup> 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 <sup>4</sup> 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 <sup>4</sup> 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 <sup>4</sup> 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 <sup>4</sup> blade	BladeCenter	Apr 2005
Positioning	<i>Ultra-dense, low power, full performance modular computing platform with superior performance</i>									
Processor(s)	<b>Up to 2 x AMD® Opteron 275 Dual Core 2.2GHz</b> , simultaneously supports 32-bit and 64-bit computing									
L2/L3 Cache	<b>1MB L2 Cache</b> per core, <b>AMD Direct Connect Architecture</b> ensures lower latency I/O									
SMP support	<b>2-way SMP</b> / 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	<b>1GB</b> std / 8GB max <sup>13</sup> / two slots used / two slots available <b>PC3200</b> 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 <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (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 <b>RAID-1 mirroring</b> [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 / <b>all SCSI bays Ultra320-enabled</b>									
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 FASiT and NAS family of products)									
Mechanical Architecture / chipsets	Supported in IBM BladeCenter / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products <b>AMD 8131 PCI-X Bridge Chip</b> providing two PCI-X buses running at 600Mhz (bus A for SCSI and Ethernet, bus B for PCI-X expansion slots) / <b>AMD 8111 HyperTransport Bridge Chip</b> supporting a 200 Mhz double-pumped HyperTransport clock (PCI, SMBus, USB, LPC to BIOS and Super I/O) / National Semiconductor® PC87417 Super I/O chip									
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)									
Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Passthrough Module</i> (the second controller requires a second optional switch or PM)									
Network-interface	<b>One connector for I/O expansion option</b> (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release <sup>20</sup>									
CD / diskette / USB	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	<b>IBM integrated system management processor (ISMP)</b> / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module									
Diagnostics	<b>Light Path Diagnostics™</b> (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									

**Server blade (side view)**

- DIMM slot 4
- DIMM slot 3
- opt CPU
- std CPU
- DIMM slot 2
- DIMM slot 1
- opt SCSI
- opt SCSI
- disk
- disk
- I/O expansion option connector
- Light Path Diagnostics

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<sup>13</sup>: 146GB with two 73.4GB SFF SCSI disks*

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

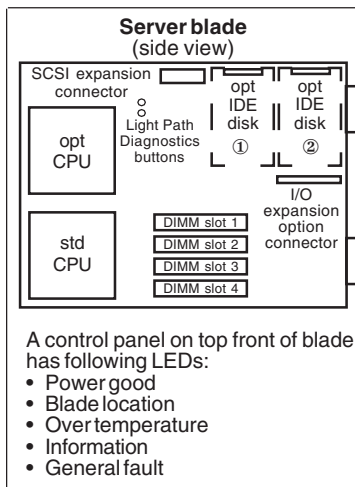
- Power good
- Blade location
- Over temperature
- Information
- General fault

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

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

IBM® Type-model	Qty x Processor <sup>1</sup>	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 <sup>4</sup> blade	BladeCenter	July 2003
8832-31X	1 x Xeon 3.06GHz	512MB	533Mhz	0MB	None	EIDE	2 fixed	2 hot-swap	Ultra320	0x2 7U <sup>4</sup> blade	BladeCenter	Oct 2003
≈< 8832-G1X	1 x Xeon 3.2GHz	1GB	533Mhz	1MB	None	EIDE	2 fixed	2 hot-swap	Ultra320	0x2 7U <sup>4</sup> blade	BladeCenter	Nov 2003

Positioning Processor(s) L2/L3 Cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior performance</i> Up to 1 x Intel® Xeon 3.2GHz with 533MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture <b>512KB</b> L2 Cache / <b>1MB</b> L3 Cache (some) / on die of processor / at processor speed <b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) Server blade contains two Intel 604-pin micro-PGA ZIF sockets, four memory DIMM slots, two IDE connectors, one SCSI expansion connector, one I/O expansion option connector, and integrated graphics and dual ethernet	
Memory	<b>512MB or 1GB</b> std / 8GB max <sup>13</sup> / two slots used / two slots available / <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (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] / <b>RAID-1 mirroring</b> standard	
SCSI disk controller	None / <b>supports optional SCSI Storage Expansion Unit</b> (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 <b>RAID-1 mirroring</b> [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 / <b>all SCSI bays Ultra320-enabled</b>	
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)	
Mechanical Architecture / chipsets	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products <b>ServerWorks® Grand Champion™ 4.0 LE</b> / CMIC LE Host Bridge (memory controller and I/O Bridge) / single-slot one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip No PCI or PCI-X slots (expansion via modules or network-interface option connector)	
Bus slots	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Optical Passthrough Module</i> (the second controller requires a second optional switch or OPM)	
Ethernet controllers	<b>One connector for I/O expansion option</b> (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release <sup>20</sup>	
Network-interface	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel	
CD / diskette / USB Kybd / video / mouse Graphics	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Rage XL / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus	
Systems mgmt	<b>IBM integrated system management processor (ISMP)</b> / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module	Xeon 2.8Ghz/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 Storage Expansion Unit (blade) 48P7058 IBM HS20 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module) 48P7061 IBM HS20 40GB <sup>2</sup> 5400 rpm ATA-100 HDD 48P7063 36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD* 06P5768 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* 06P5776 173.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* 06P5756 146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD* 32P0728 * Disk requires SCSI Storage Expansion Unit
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD	
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel	
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system	



- 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<sup>13</sup>:*  
80GB with two 40GB EIDE disks or 293.6GB\* with two 146.8GB SL SCSI disks

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

IBM® Type-GAV-model	Processor	L2 GHz cache	FSB MHz	Memory	Disk controller	Disk bays	SCSI Support with optional stor exp unit	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 <sup>4</sup> 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 <b>Low Voltage Processor</b> for reduced heat output allowing greater rack population	
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 1MB std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet	
Memory	512MB/1GB std / 8GB <sup>13</sup> 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 / <b>Single channel Ultra320 SCSI controller</b> (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; <b>all SCSI bays Ultra320-enabled</b> ) /	
External Storage	Support for IBM TotalStorage™ solutions (including FASiT 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 <sup>20</sup>	
CD / Diskette / USB Kybd / video / mouse Graphics controller	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector	
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2168 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module	Xeon 2.8GHz/800/1MB L2 Cache EM64T Proc Upg Xeon 2.8GHz/800/2MB L2 Cache EM64T Proc Upg Xeon 3.0GHz/800/1MB L2 Cache EM64T Proc Upg Xeon 3.2GHz/800/1MB L2 Cache EM64T Proc Upg Xeon 3.4GHz/800/1MB L2 Cache EM64T Proc Upg Xeon 3.6GHz/800/1MB L2 Cache EM64T Proc Upg Xeon 3.68GHz/800/2MB L2 Cache EM64T Proc Upg
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	13N0692 25R8878 13N0693 13N0657 13N0658 13N0659 13N0697
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	73P3522 73P3522 73P2866 73P2867
Software ship group	Documentation CD, Broadcom CD	4GB (2x2GB) PC2-3200 ECC DDR2 ChipK RDIMM Kit IBM 36.4GB 10K Ultra320 SCSI 2.5" SFF NHS HDD IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD
Cooling Fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel	90P1312 90P1313 26K4817 26K4841 26K4842 02R9080
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system	BladeCenter SCSI Storage Exp Unit BladeCenter SFF Fibre Channel Exp Card BladeCenter SFF Gigabit Ethernet Exp Card BladeCenter Optical Pass-thru Module Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>

**Server blade (side view)**

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

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

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

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

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

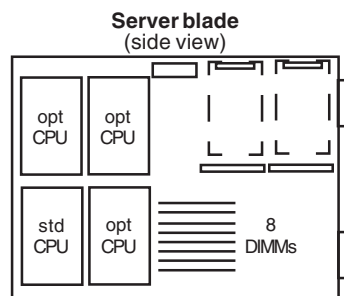
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
  - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
  - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
  - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9523)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information  
☆ = models announced September 2005



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

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> <b>1 x Intel® Xeon 2.8GHz MP</b> with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture <b>512KB L2 Cache / 2MB L3 Cache</b> / on die of processor / at processor speed <b>4-way SMP</b> / up to four Xeon MP Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion unit connector, two I/O expansion option connectors, integrated graphics and four ethernet ports																													
Memory	<b>2GB</b> std / 16GB max <sup>13</sup> / two slots used / six slots available / eight total slots <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (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 / <b>supports optional SCSI Storage Expansion Unit</b> (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 <b>RAID-1 mirroring</b> [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 / <b>all SCSI bays Ultra320-enabled</b>																													
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)																													
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products																													
Architecture / chipsets	<b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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	<b>Two connectors for I/O expansion option</b> / 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 Kybd / video / mouse Graphics	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																													
Systems mgmt	<b>Intel integrated Baseboard Management Controller (BMC)</b> / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module																													
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																													
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																													
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD																													
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel																													
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system																													
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**Server blade (side view)**

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

*Maximum internal disk capacity for each HS40 blade server<sup>13</sup>: 293.6GB\* with two 146.8GB SL SCSI disks*

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

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

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

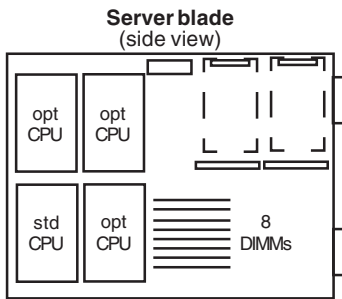
- ↪ 3 year parts and labor
- ↪ International Warranty Service<sup>3</sup>
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↪ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519)
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- ↪ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

See footnotes for important warranty information

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

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

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> <b>1 x Intel® Xeon MP up to 3.0GHz</b> with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture <b>512KB L2 Cache / Up to 4MB L3 Cache</b> / on die of processor / at processor speed <b>4-way SMP</b> / up to four Xeon MP Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion unit connector, two I/O expansion option connectors, integrated graphics and four ethernet ports									
Memory	<b>Up to 2GB</b> std / 16GB max <sup>13</sup> / 51X: two slots used / 61X/71X: four slots used / eight total slots <b>PC2100</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (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 / <b>supports optional SCSI Storage Expansion Unit</b> (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 <b>RAID-1 mirroring</b> [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 / <b>all SCSI bays Ultra320-enabled</b>									
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)									
Mechanical Architecture / chipsets	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products <b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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 <b>4-port GB Ethernet Switch Module</b> (the second controller requires a second optional Ethernet Switch Module)									
Network-interface	<b>One connector for I/O expansion option</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)									
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel									
Kybd / video / mouse Graphics	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus									
Systems mgmt	<b>Intel integrated Baseboard Management Controller (BMC)</b> / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module									
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)									
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode									
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD									
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel									
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system									
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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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- ▷ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each HS40 blade server<sup>13</sup>: 293.6GB\* with two 146.8GB SL SCSI disks

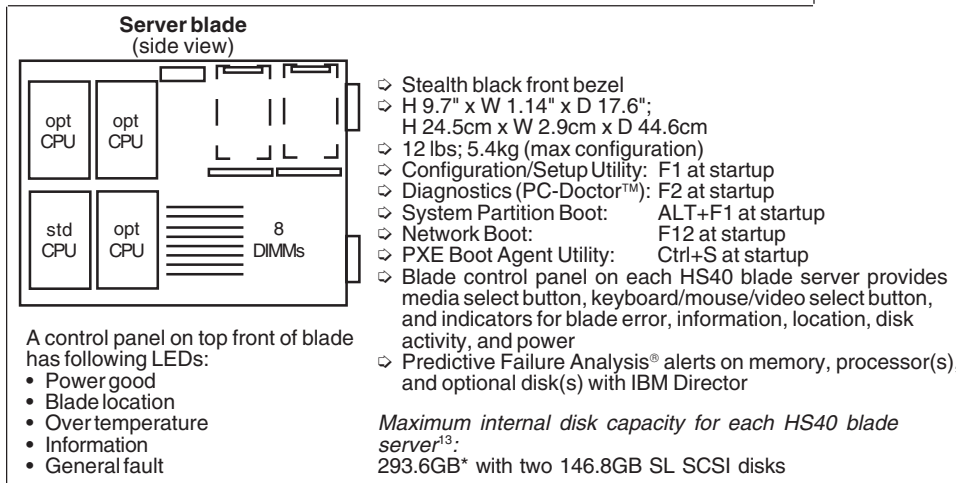
**LIMITED WARRANTY<sup>3</sup>**

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

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

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> <b>1 x Intel® Xeon 2.0GHz MP</b> with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture <b>512KB L2 Cache / 1MB L3 Cache</b> / on die of processor / at processor speed <b>4-way SMP</b> / up to four Xeon Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion connector, one I/O expansion option connector, and integrated graphics and dual ethernet																													
Memory	<b>1GB</b> std / 16GB max <sup>13</sup> / two slots used / six slots available / eight total slots <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (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 / <b>supports optional SCSI Storage Expansion Unit</b> (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 <b>RAID-1 mirroring</b> [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 / <b>all SCSI bays Ultra320-enabled</b>																													
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)																													
Mechanical Architecture / chipsets	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products <b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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 <b>4-port GB Ethernet Switch Module</b> (the second controller requires a second optional Ethernet Switch Module)																													
Network-interface	<b>One connector for I/O expansion option</b> / 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																													
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Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system																													
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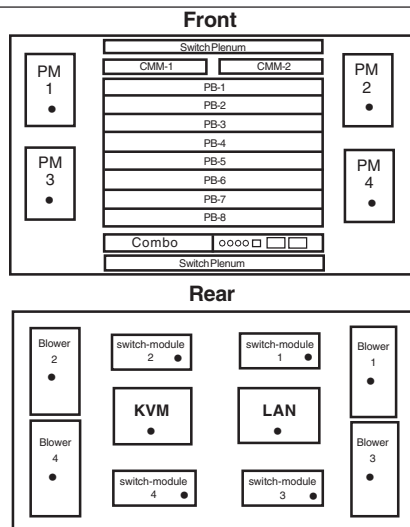
**LIMITED WARRANTY<sup>3</sup>**

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- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

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

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	Mechanical	Available date
8720-1RX 8832 HS20 / 8839 HS40		0 / 8	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	1300W	4 / 4	8U <sup>4</sup> rack	Jul 2004
Positioning Description	<i>Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments</i> 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 Ethernet Switch Module	<i>Std: none; max: four / hot-swap / rear access</i> 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	<i>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</i>									
Power modules	<i>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 &amp; 2) supply power to switch bays 1 &amp; 2, both management modules, blade bays 1 - 4, and the media tray; two additional power modules provide full system redundant power and power to switch bays 3 &amp; 4 and blade bays 5 - 8 All: load balancing/ voltage-sensing / auto-restart / no fans in power module(s)</i>									
Blower modules	<i>Std: four; max: four / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake</i>									
Mechanical Optical / USB	<b>EIA 19" rack models (8U<sup>4</sup>) x 20" deep / designed for EIA-310D and UTF Four Post Racks</b> 24X-10X-24X-8X <sup>6</sup> 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	<i>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) /</i>									
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 Redundant Management Module	90P3741	IBM 1300W DC Power Supply Module (x2)	90P3742
IBM BladeCenter HS20 Low Profile Handle	25K8358	IBM BladeCenter PCI I/O Expansion Unit	90P3721
IBM BladeCenter HS40 Low Profile Handle	25K8359	IBM BladeCenter 1GB Flash Disk Drive	90P3771
IBM Sleek 2-Button Stealth Black Mouse	28L3673	IBM BladeCenter 2GB Flash Disk Drive	90P3772
NetBAY42 Enterprise Rack Cabinet	930842S	IBM BladeCenter 4GB Flash Disk Drive	90P3773
Four Post Rack Mount Kit	90P3775	IBM FASiT700 Fibre Channel Storage Server	17421RU
Two Post Rack Mount Kit	90P3774	IBM FASiT200 Storage Server	35421RU
		IBM External USB Floppy Drive	05K9276
		IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
		<ul style="list-style-type: none"> <li>• Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a></li> <li>• Solutions available from IBM BladeCenter Alliance program partners</li> </ul>	



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

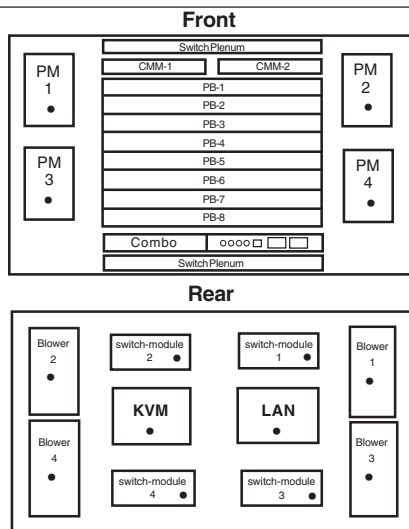
Bay	Switch Function
1	Ethernet link 1 for all blade servers
2	Ethernet link 2 for all blade servers
3	Network connection 1 for all blade server I/O expansion options (Gb Ethernet/Fibre Channel)
4	Network connection 2 for all blade server I/O expansion options (Gb ethernet/Fibre Channel)

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

- ⊕ 3 year parts and labor
- ⊕ International Warranty Service<sup>3</sup>
- ⊕ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⊕ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9205)
- ⊕ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊕ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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	Mechanical	Available date
8730-1RX 8832 HS20 / 8839 HS40		0 / 8	0 / 4	Ethernet, Fibre Channel	1 / 2	2 / 4	1300W	4 / 4	8U <sup>4</sup> rack	Jul 2004
Positioning Description	<i>Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments</i> 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 Ethernet Switch Module	<i>Std: none; max: four / hot-swap / rear access</i> 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	<i>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</i>									
Power modules	<i>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 &amp; 2) supply power to switch bays 1 &amp; 2, both management modules, blade bays 1 - 4 and media tray; Two additional power modules provide full system redundant power and power to switch bays 3 &amp; 4, and blade bays 5 - 8 All: load balancing / voltage-sensing / auto-restart / no fans in power module(s)</i>									
Blower modules	<i>Std: four; max: four / Calibrated Vectedored Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake</i>									
Mechanical Optical / USB	<b>EIA 19" rack models (8U<sup>4</sup>) x 20" deep / designed for EIA-310D and UTF Four Post Racks</b> 24X-10X-24X-8X <sup>6</sup> 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	<i>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)</i>									
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 Redundant Management Module	90P3741	IBM 1300W AC Power Supply Module (x2)	90P3743
IBM BladeCenter HS20 Low Profile Handle	25K8358	IBM BladeCenter PCI I/O Expansion Unit	90P3721
IBM BladeCenter HS40 Low Profile Handle	25K8359	IBM BladeCenter 1GB Flash Disk Drive	90P3771
IBM Sleek 2-Button Stealth Black Mouse	28L3673	IBM BladeCenter 2GB Flash Disk Drive	90P3772
NetBAY42 Enterprise Rack Cabinet	930842S	IBM BladeCenter 4GB Flash Disk Drive	90P3773
Four Post Rack Mount Kit	90P3775	IBM FASiT700 Fibre Channel Storage Server	17421RU
Two Post Rack Mount Kit	90P3774	IBM FASiT200 Storage Server	35421RU
APC Smart-UPS 5000RMB	37L6861	IBM External USB Floppy Drive	05K9276
		IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
		• Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>	
		• Solutions available from IBM BladeCenter Alliance program partners	



- ◊ Dimensions: H13.76"(8U) x W17.4" x D20"(front bezel to rear I/O); H349.5mm x W441.9mm x D508mm
- ◊ Weight: 98 to 192 lb; 44.5 to 87.38kg
- ◊ Stealth black color bezel
- ◊ Tool-free customer serviceability
- ◊ Access server blades, power supplies, mgmt modules, media tray and expansion units from front
- ◊ Access switch modules and blowers from rear
- ◊ Fits into Standard Central Office environments
- ◊ Air Intake Filtering
- ◊ Predictive Failure Analysis® alerts 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<sup>3</sup>**

- ↔ 3 year parts and labor
- ↔ International Warranty Service<sup>3</sup>
- ↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↔ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9205)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↔ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Qty x Processor <sup>1</sup>	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 <sup>4</sup> blade	BladeCenter T	Feb 2004
8832-9TX	1 x Xeon 2.4GHz	1GB	533Mhz	2MB	None	EIDE	2 fixed	2 HS Ultra320	0x2	8U <sup>4</sup> 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<sup>13</sup> / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)

**IDE controller/bays** Enhanced IDE ATA-100 controller in CSB6-U South Bridge / two connectors/buses on planar / each supports one 2.5" IDE disk / no cable as IDE disk attaches to riser card and tray (included with option kit) / Supports max of two IDE disks / space for only one IDE disk if an I/O expansion option installed [Fibre Channel] / **RAID-1 mirroring** standard  
**SCSI disk controller** None / **supports optional SCSI Storage Expansion Unit** (a blade occupying adjacent blade slot / connects to HS20 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports **RAID-1 mirroring** [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)  
**SCSI disk bays** Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**  
**External storage** Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)

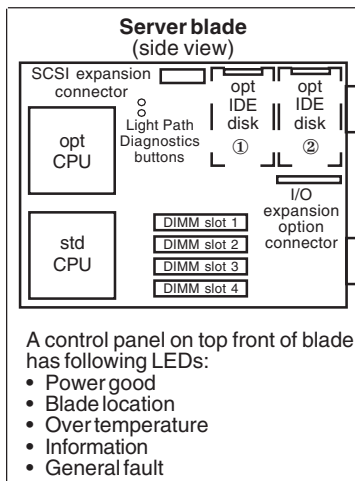
**Mechanical** Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products **ServerWorks® Grand Champion™ 4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / single slot one CIOBE-S I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6-U South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip No PCI or PCI-X slots (expansion via modules or network-interface option connector)

**Ethernet controllers** Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)  
**Network-interface** **One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release<sup>20</sup>  
**CD / diskette / USB** None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel  
**Kybd / video / mouse** None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel  
**Graphics** SVGA / ATI® Rage XL / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

**Systems mgmt** **IBM integrated system management processor (ISMP)** / HS2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module  
**Diagnostics** **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)  
**Security** Power-on password / administrator password / unattended boot / selectable boot / unattended start mode  
**Software ship group** Documentation CD, IBM Director 4.1 CD, Device Driver CD  
**Cooling fans** Uses cooling from BladeCenter (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel  
**Power supply** Uses power module(s) in BladeCenter (type 8677)  
**Prerequisites** Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

Xeon 3.2Ghz/512KB L2 / 1MB L3 Cache	13N0650
Proc Upg	
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
IBM HS20 SCSI Storage Expansion Unit (blade)	48P7058
IBM HS20 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)	48P7061
IBM HS20 40GB <sup>2</sup> 5400 rpm ATA-100 HDD	48P7063
36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728

\* Disk requires SCSI Storage Expansion Unit



- Bay ① 3.5", 9.5mm, no front access, optional ThinkPad® IDE disk
  - Bay ② 3.5", 9.5mm, no front access, optional ThinkPad IDE disk
  - Stealth black front bezel
  - H 9.7" x W 1.14" x D 17.6"
  - H 24.5cm x W 2.9cm x D 44.6cm
  - 12 lbs; 5.4kg (max configuration)
  - Configuration/Setup Utility: F1 at startup
  - Diagnostics (PC-Doctor™): F2 at startup
  - System Partition Boot: ALT+F1 at startup
  - Network Boot: F12 at startup
  - PXE Boot Agent Utility: Ctrl+S at startup
  - Blade control panel on each HS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
  - Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director
- Maximum internal disk capacity for each HS20 blade server<sup>13</sup>:*  
 80GB with two 40GB EIDE disks or  
 293.6GB\* with two 146.8GB SL SCSI disks

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
  - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

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

# IBM eServer BladeCenter™ HS20 Low Profile Handle

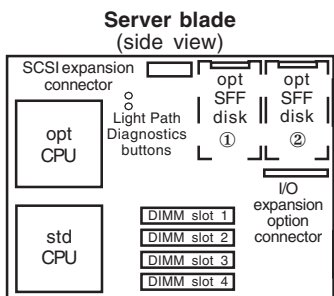
(8843) January 2005

xREF by eServer Field Skills and Education Team

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

Processor(s)	1 x Intel® Xeon 2.8 Low Voltage or 3.6 GHz with 800MHz frontside bus (FSB) / EM64T / 1MB L2 ECC Cache / Hyper-Threading technology / Low Voltage Processors reduce heat output for increased rack density without increased cooling capacity																																										
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 1MB std and max / at processor speed																																										
Memory	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet																																										
SCSI disk controller	512MB/1GB std / 8GB¹³ max / two slots used / two slots available / PC2-3200 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel /																																										
SCSI Disk bays	LSI Logic® 53C1020 SCSI controller / Single channel Ultra320 SCSI controller (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports RAID-1 & 1E mirroring (supported in 32-bit legacy mode only) / One 16-bit channel (one internal) / Internal channel: one 2-drop 16-bit 68-pin LVD SCSI cable																																										
External Storage	Two 2.5-inch Small Form Factor (SFF) Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; all SCSI bays Ultra320-enabled) / Support for IBM TotalStorage™ solutions (including FASTT and NAS family of products)																																										
Mechanical Architecture/Chipset	7U Blade / Supported in IBM BladeCenter T 8720-1XX or 8730-1XX																																										
BUS slots	Intel E7520 chipset / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface																																										
Ethernet	No PCI or PCI-X slots (expansion via modules or network-interface option connector)																																										
Network Interface	Dual gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM)																																										
CD / Diskette / USB Kybd / video / mouse Graphics controller	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release²⁰																																										
Systems Mgmt	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel																																										
Diagnostics	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel																																										
Security	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector																																										
Software ship group	IBM Baseboard Management Controller (BMC) / H8S2168 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module																																										
Cooling Fans	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																																										
Power supply(s) Prerequisites	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																																										
	Documentation CD, Broadcom CD																																										
	Uses cooling from BladeCenter T (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel																																										
	Uses power module(s) in BladeCenter T (type 8720/30)																																										
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Bay ① 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk  
 Bay ② 3.5", 9.5mm, no front access, optional 2.5-inch SFF SCSI disk



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

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

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

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

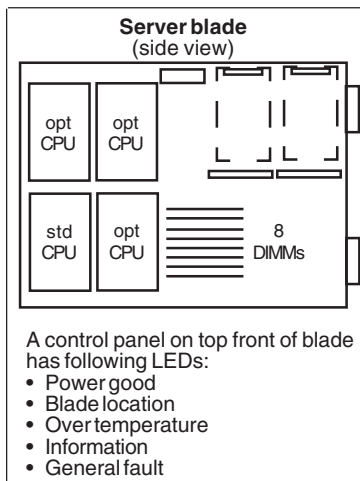
### LIMITED WARRANTY<sup>3</sup>

- ⇒ 3 year parts and labor
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
  - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
  - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
  - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9523)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

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

Positioning Processor(s) L2/L3 cache SMP support Implementation	<i>Ultra-dense, highly manageable modular computing platform with superior 4-way performance</i> Up to 1 x Intel® Xeon 2.8GHz MP with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture <b>512KB L2 Cache / 2MB L3 Cache</b> / on die of processor / at processor speed <b>4-way SMP</b> / up to four Xeon MP Processors (same speed/cache size) Server blade contains four Intel 604-pin micro-PGA ZIF sockets, four memory DIMM slots, one SCSI expansion connector, two I/O expansion option connector, integrated graphics and four ethernet ports																															
Memory	<b>2GB</b> std / 16GB max <sup>13</sup> / two slots used / six slots available / eight total slots <b>PC2100</b> 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (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 / <b>supports optional SCSI Storage Expansion Unit</b> (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 <b>RAID-1 mirroring</b> [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 / <b>all SCSI bays Ultra320-enabled</b>																															
External storage	Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products)																															
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products																															
Architecture / chipsets	<b>ServerWorks® Grand Champion™ 4.0 LE</b> / 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	<b>Two connectors for I/O expansion option</b> (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release <sup>20</sup>																															
CD / diskette / USB Kybd / video / mouse Graphics	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus																															
Systems mgmt	<b>Intel integrated Baseboard Management Controller (BMC)</b> / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module																															
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)																															
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode																															
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD																															
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel																															
Power supply Prerequisites	Uses power module(s) in BladeCenter (type 8677) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system																															
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- 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<sup>13</sup>: 293.6GB\* with two 146.8GB SL SCSI disks

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 69P9519)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9527)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

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



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

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

<sup>2</sup> 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.

<sup>3</sup> For terms and conditions or a copy of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the U.S. Copies available upon request. Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. International Warranty Service is available in any country in which this product is sold and serviced. Service delivery methods and parts availability vary by country, may be different from that in the country of purchase, and are subject to change without notice. Fees and restrictions may apply in some countries.

<sup>4</sup> A single "U", or rack unit, is 1.75" or 44.45mm.

<sup>5</sup> S.M.A.R.T. stands for Self-Monitoring, Analysis and Reporting Technology.

<sup>6</sup> CD and DVD drives speeds are variable and are often less than the maximum.

<sup>7</sup> These services are available for machines normally used for business, professional, or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For non-critical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives, and channel controllers, require their own, separate service coverage, they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. Not available in all states; call your IBM representative for details.

<sup>8</sup> Subject to conditions.

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

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

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

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

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

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

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

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

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

<sup>18</sup> Diskettes and hard copy documentation available at extra charge.

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

<sup>20</sup> Statement of direction and subject to availability.

<sup>21</sup> 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.

<sup>22</sup> 16GB Memory max with PC2700 DIMMs, 8GB Max with PC3200 DIMMs



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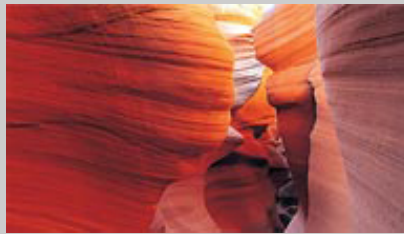
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