xSeries   Reference   (xREF)

including

IBM™
System x™ **/ xSeries**™ **/   BladeCenter**™

October 17, 2006

xref@us.ibm.com

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

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

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

Memory	**256MB or 512MB** / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered /

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

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

Ethernet	10/100/1000 gigabit / Broadcom 5721 / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
CD-ROM / diskette	*Some: CD-ROM:* 48X-20X[6] CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X[6] / None standard
Ports	*Front:* two USB (Ver 2.0); *Back:* two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	None

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

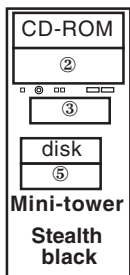|	
Security	Optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse/display

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

Option	Part #
512MB PC2-4200 CL3 ECC DDR2 RoHS	30R5148
2x1GB PC2-4200 CL3 ECC DDR2 RoHS	30R5149
2x2GB PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA-150 (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA-150 (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA-150 (7.2K) simple-swap HDD	39M4508
IBM 500GB SATA-150 (7.2K) simple-swap HDD	39M4514
48X/32X/48X/16X Max[6] CD-RW/DVD (black)	32R2905
IBM Multi-burner Plus	32R2906
IBM USB Portable Diskette Drive	05K9276
36/72GB DDS/5 Internal Tape Drive	71P9145
VXA-2 Tape Drive	59P6746
IBM 20/40GB TR7 Internal Tape Drive	48P7042
IBM ServeRAID-7t SATA Controller	71P8648
IBM Ultra320 SCSI Controller2	13N2249

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

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

CD-ROM

②

③

disk
⑤

Mini-tower

Stealth black

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

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

✧ Removable left side panel
✧ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
✧ Advanced Configuration Power Interface (ACPI) 1.0
✧ Device Drivers and Diagnostics CD-ROM included
✧ Four stabilizing feet

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

LIMITED WARRANTY[3]
➥ **1 year parts and labor**
➥ **International Warranty Service**[3]
➥ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
➥ **On site service upgrade options (in eligible locations):**[7]
• **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 41W9318)
• **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 41W9317)
• **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41W9316)
• **3 year IOR 9x5, NBD response** (ServicePac part num 41W9315)
➥ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
➥ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

IBM® Machine Type Model		Proccessor	Speed¹/Core	L2 Cache	FSB MHz	Memory	Disk	Disk controller	Maximum Capacity	Slots x bays	Hard disk bays	Ethernet	Available date
8486 - EAx		Celeron® D 331	2.66GHz	256KB	533	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EBx		Celeron D 331	2.66GHz	256KB	533	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - ECx		Pentium® 4 521	2.8GHz/SC	1MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EDx		Pentium 4 631	3.0GHz/SC	2MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EEx		Pentium 4 631	3.0GHz/SC	2MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EFx		Pentium 4 641	3.2GHz/SC	2MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EGx		Pentium D 920	2.8GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EHx		Pentium D 920	2.8GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EJx		Pentium D 930	3.0GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Feb 2006
8486 - EKx		Pentium D 930	3.0GHz/DC	4MB	800	512MB	80GB	SATA	500GB	4 x 5	2 fixed	Gigabit	Mar 2006

Positioning	*Uniprocessor, entry server designed to meet small business needs and budgets*
Processor(s)	**Intel® Pentium 4 up to 3.2GHz Single-Core 800MHz FSB / Pentium D up to 3.0GHz Dual-Core 800MHz FSB / Intel Celeron D 2.66GHz 533MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**1 or 2MB** std on Pentium 4 / **4MB** std on Pentium D / **256KB** std and max on Celeron / ECC / full-speed
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI), integrated SATA and Gigabit Ethernet.
SMP support	No SMP support / no processor upgrade

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

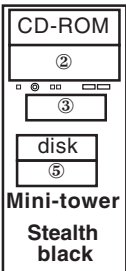|	
SCSI disk controller	None standard / Ultra320 SCSI controller2 (LVD 320MB/sec) optional for tape backup
IDE disk controller	Enhanced IDE / ATA-100 integrated in I/O Controller Hub / one connector on planar
SATA disk controller	Dual channel SATA controller (1.5GB/sec) / supports 2 drives standard
Cables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

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

Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
CD-ROM / diskette	*Some: CD-ROM:* 48X-20X⁶ CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X⁶ / None standard
Ports	*Front:* two USB (Ver 2.0); *Back:* two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	None

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

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

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

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

512MB PC2-4200 CL3 ECC DDR2 RoHS	30R5148
2x1GB PC2-4200 CL3 ECC DDR2 RoHS	30R5149
2x2GB PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA-150 (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA-150 (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA-150 (7.2K) simple-swap HDD	39M4508
IBM 500GB SATA-150 (7.2K) simple-swap HDD	39M4514
48X/32X/48X/16X Max⁶ CD-RW/DVD (black)	32R2905
IBM Multi-burner Plus	32R2906
IBM USB Portable Diskette Drive	40K1692
36/72GB DDS/5 Internal Tape Drive	71P9145
VXA-2 Tape Drive	59P6746
IBM 20/40GB TR7 Internal Tape Drive	48P7042
IBM ServeRAID-7t SATA Controller	71P8648
IBM Ultra320 SCSI Controller2	13N2249
Other options at **ibm.com**/pc/us/accessories	


```
CD-ROM
  ②
  ③
 disk
  ⑤
Mini-tower
Stealth
black
```

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

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

✧ Removable left side panel
✧ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
✧ Advanced Configuration Power Interface (ACPI) 1.0
✧ Device Drivers and Diagnostics CD-ROM included
✧ Four stabilizing feet

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

LIMITED WARRANTY³
↪ **1 year parts and labor**
↪ **International Warranty Service³**
↪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
↪ **On site service upgrade options (in eligible locations):⁷**
 • **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 41W9318)
 • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 41W9317)
 • **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41W9316)
 • **3 year IOR 9x5, NBD response** (ServicePac part num 41W9315)
↪ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
↪ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

See footnotes for important warranty information

IBM Machine Type	Model	Proccessor	Speed[1]/Core	L2 Cache	FSB MHz	Memory	Disk	Disk controller	Maximum Capacity	Slots x bays	Hard disk bays	Ethernet	Available date
8486 - ELX	Pentium® 4 631	3.0GHz/SC	2MB	800	1 x 512MB	160GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006
8486 - EMX	Pentium 4 631	3.0GHz/SC	2MB	800	1 x 512MB	80GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006
8486 - ENX	Pentium 4 651	3.4GHz/SC	2MB	800	1 x 512MB	80GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006
8486 - E8X	Pentium D 930	3.0GHz/DC	4MB	800	2 x 512MB	80GB	SATA	1TB	4 x 5	2 fixed	Gigabit	June 2006

Positioning	*Uniprocessor, entry server designed to meet small business needs and budgets*
Processor(s)	**Intel® Pentium 4 up to 3.4GHz Single-Core 800MHz FSB / Pentium D up to 3.0GHz Dual-Core 800MHz FSB / Intel Celeron D 2.66GHz 533MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**1 or 2MB** std on Pentium 4 / **4MB** std on Pentium D / **256KB** std and max on Celeron / ECC / full-speed
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI), integrated SATA and Gigabit Ethernet.
SMP support	No SMP support / no processor upgrade

Memory	**512MB** / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered /

SCSI disk controller	None standard / Ultra320 SCSI controller2 (LVD 320MB/sec) optional for tape backup
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
SATA disk controller	Dual channel SATA controller (1.5GB/sec) / supports 2 drives standard
Cables	One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk
Disk	80 or 160GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
RAID Controller	None standard / ServeRAID 7t controller optional

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

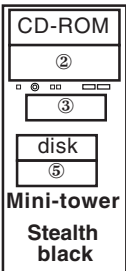|	
Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
CD-ROM / diskette	*Some: CD-ROM:* 48X-20X[6] CD-ROM, IDE; some: CDRW/DVD-ROM Combo:48X/32X/48X/16X[6] / None standard
Ports	*Front:* two USB (Ver 2.0); *Back:* two serial (9-pin), parallel, two USB (Ver 2.0), keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	None

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

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

Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool) included and IBM Director (system hardware mgmt software) optional	512MB PC2-4200 CL3 ECC DDR2 RoHS	30R5148
		2x1GB PC2-4200 CL3 ECC DDR2 RoHS	30R5149
		2x2GB PC2-4200 CL3 ECC DDR2 RoHS	30R5150
		IBM 80GB SATA-150 (7.2K) simple-swap HDD	39M4500
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black)	IBM 160GB SATA-150 (7.2K) simple-swap HDD	39M4504
Cooling fans	Three variable speed fans (cpu heatsink, rear, power supply) / not redundant / not hot-swap	IBM 250GB SATA-150 (7.2K) simple-swap HDD	39M4508
		IBM 500GB SATA-150 (7.2K) simple-swap HDD	39M4514
Power supply	310 watts / universal / manual switching / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)	48X/32X/48X/16X Max[6] CD-RW/DVD (black)	32R2905
		IBM Multi-burner Plus	32R2906
		IBM USB Portable Diskette Drive	40K1692
		36/72GB DDS/5 Internal Tape Drive	71P9145
		VXA-2 Tape Drive	59P6746
		IBM 20/40GB TR7 Internal Tape Drive	48P7042
		IBM ServeRAID-7t SATA Controller	71P8648
		IBM Ultra320 SCSI Controller2	13N2249
		Other options at **ibm.com**/pc/us/accessories	

```
 ┌─────────────┐
 │   CD-ROM    │
 │      ②      │
 ├─────────────┤
 │ [·|⊙|▭|▭|▭] │
 │      ③      │
 ├─────────────┤
 │    disk     │
 │      ⑤      │
 ├─────────────┤
 │ Mini-tower  │
 │   Stealth   │
 │    black    │
 └─────────────┘
```

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

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

◇ Removable left side panel
◇ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
◇ Advanced Configuration Power Interface (ACPI) 1.0
◇ Device Drivers and Diagnostics CD-ROM included
◇ Four stabilizing feet

◇ H 17.24" x W 8.07" x D 19.57"
◇ H 438mm x W 205mm x D 497mm
◇ 30.86 to 37.48 pounds (14 to 17kg)
◇ BTU Output:
   Minimum: 326 Btu/hr (96 watts)
   Maximum: 1024 Btu/hr (300 watts)

LIMITED WARRANTY[3]
↪ **1 year parts and labor**
↪ **International Warranty Service[3]**
↪ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
↪ **On site service upgrade options (in eligible locations):[7]**
  • **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 41W9318)
  • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 41W9317)
  • **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41W9316)
  • **3 year IOR 9x5, NBD response** (ServicePac part num 41W9315)
↪ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
↪ **24x7[14] toll-free support for warranty issues during the warranty period[3]**

See footnotes for important warranty information

IBM @server™ xSeries™ 206m

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

IBM Machine Type GAV-model	Proccessor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Power Supply	Ethernet	Available date
8485/8490 10y-10x	Pentium® 4 531 3.0GHz¹	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	6 x 7	4 hot-swap	1x400W	Gigabit	Oct 2005
8485/8490 3By-3Bx	Pentium 4 650 3.2GHz	2MB	800	1GB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490 70y-70x	Pentium D 820 2.8GHz	2x1MB	800	1GB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490 7Ay-7Ax	Pentium D 820 2.8GHz	2x1MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Oct 2005
8485/8490 80y-80x	Pentium D 830 3.0GHz	2x1MB	800	1GB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Oct 2005
8485/8490 8Ay-8Ax	Pentium D 830 3.0GHz	2x1MB	800	512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Oct 2005

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

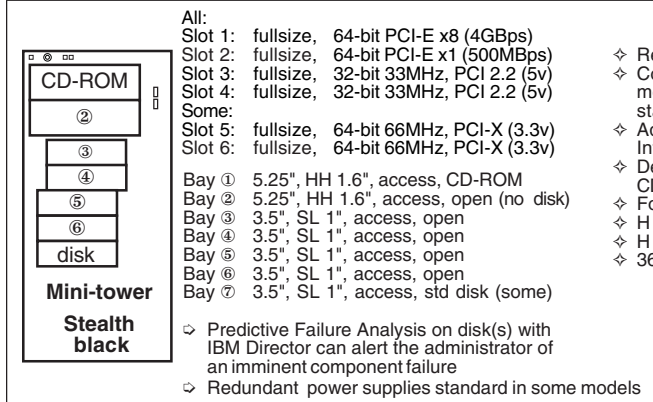|	
Memory	**512MB or 1GB** std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

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

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

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

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

Security	Mechanical side panel key lock / U-Bolt Tie-down capability/ power-on password / boot sequence control / operation without keyboard/mouse	
Software	**ServerGuide™** (CD-based automated network OS installation and configuration tool), **ServeRAID™** (RAID management), IBM Director (system hardware management software) and many utilities	

Option	Part #
512MB PC2-4200 CL3 ECC DDR2RoHS	30R5148
2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5149
4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
IBM 500GB SATA (7.2K) simple-swap HDD	39M4514
80GB Hot-Swap SATA HDD	39M4518
160GB Hot-Swap SATA HDD	39M4522
250GB Hot-Swap SATA HDD	39M4526
73GB 10K 3.5" SAS Hot-Swap HDD	26K5709
146GB 10K 3.5" SAS Hot-Swap HDD	26K5710
300GB 10K 3.5" SAS Hot-Swap HDD	26K5711
36GB 15K 3.5" SAS Hot-Swap HDD	26K5697
73GB 15K 3.5" SAS Hot-Swap HDD	26K5698
48X/32X/48X/16X Max⁶ CD-RW/DVD-ROM Combo (black)	32R2905
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 5Ux20D Tower-to-Rack Kit	39R9361
IBM ServeRAID-7t SATA Integrated Controller	71P8648
Other options at **ibm.com**/pc/us/accessories	

Keyboard / mouse	Optional
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap
Power supply	Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed)

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

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

CD-ROM
②
③
④
⑤
⑥
disk

Mini-tower

Stealth black

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

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

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

LIMITED WARRANTY³

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

See footnotes for important warranty information

IBM @server™ xSeries™ 206m

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

IBM® Machine Type GAV-model	Proccessor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Power Supply	Ethernet	Available date
8485/8490 A2y-A2x	Pentium® 4 521 2.8GHz[1]	1MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Feb 2006
8485/8490 B2y-B2x	Pentium 4 631 3.0GHz	2MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Feb 2006
8485/8490 G2y-G2x	Pentium D 920 2.8GHz	4MB	800	512MB	None/SATA	1.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Feb 2006
8485/8490 H2y-H2x	Pentium D 930 3.0GHz	4MB	800	512MB	None/SAS/SATA	1.0TB	6 x 7	4 hot-swap	1x400W	Gigabit	Feb 2006
8485/8490 J2y-J2x	Pentium D 940 3.2GHz	4MB	800	2x512MB	None/SAS/SATA	1.0TB	6 x 7	4 hot-swap	1x400W	Gigabit	Feb 2006
8485/8490 J4y-J4x	Pentium D 940 3.2GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Feb 2006

Positioning	*Single socket, entry server for small and medium size business' and distributed enterprises*
Processor(s)	**Intel® Pentium 4 up to 3.0GHz Single-Core 800MHz FSB / Pentium D up to 3.2GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**1 or 2MB** std on Pentium 4 / **4MB** std on Pentium D
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, some: four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI) some: six slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI, 2 PCI-X), integrated SATA and Gigabit Ethernet.
SMP support	No SMP support / no processor upgrade
Memory	**512MB or 1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered
SAS disk controller	Integrated SAS controller / supports SAS or SATA drives
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
SATA disk controller	Four channel SATA controller (3.0GB/sec) / supports 4 drives standard
Cables	One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk
Disk	Some: 80GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
RAID Controller	IBM ServeRAID™ 8e (RAID 0, 1) / on planar / supports SATA or SAS interface
Rack support	5U[4] rack mount support via tower-to-rack kit option
Bus slots (see below)	All: one PCI Express® bus / one 64-bit PCIe™ x8 / one 64-bit PCIe x1/ two 32-bit 33MHz 5v PCI 2.2 slots / some: two 64-bit 66MHz 3.3v PCI-X slots / no hot-swap Active™ PCI slots
Chipset	**Intel E7230 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / None standard
Ports	*Front:* two USB (2.0); *Back:* two serial (9-pin), parallel, two USB (2.0), keyboard, mouse, ethernet (RJ45) and monitor
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan speed and failure, and voltages / **secure remote power on/off** / **support for optional Remote Supervisor Adapter II**
Graphics controller	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Security	Mechanical side panel key lock / U-Bolt Tie-down capability/ power-on password / boot sequence control / operation without keyboard/mouse
Software	**ServerGuide™** (CD-based automated network OS installation and configuration tool), **ServeRAID™** (RAID management), IBM Director (system hardware management software) and many utilities
Keyboard / mouse	Optional
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap
Power supply	Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed)

Option	Part
512MB PC2-4200 CL3 ECC DDR2RoHS	30R5148
2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5149
4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
IBM 500GB SATA (7.2K) simple-swap HDD	39M4514
80GB Hot-Swap SATA HDD	39M4518
160GB Hot-Swap SATA HDD	39M4522
250GB Hot-Swap SATA HDD	39M4526
73GB 10K 3.5" SAS Hot-Swap HDD	40K1039
146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
48X/32X/48X/16X Max[6] CD-RW/DVD-ROM Combo (black)	32R2905
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 5Ux20D Tower-to-Rack Kit	39R9361
IBM ServeRAID-7t SATA Integrated Controller	71P8648
Other options at **ibm.com**/pc/us/accessories	

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

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

```
 ┌──────────────┐
 │ □ ◎ □        │
 │ ┌──────────┐ │
 │ │ CD-ROM   │ │
 │ │    ②     │ │
 │ ├──────────┤ │
 │ │    ③     │ │
 │ │    ④     │ │
 │ │    ⑤     │ │
 │ │    ⑥     │ │
 │ │  disk    │ │
 └──────────────┘
   Mini-tower
    Stealth
     black
```

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

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

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

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

IBM @server™ xSeries™ 206m

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

IBM® Machine Type GAV-model	Proccessor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Power Supply	Ethernet	Available date
8485/8490 B4y-B4x	Pentium® 4 631 3.0GHz¹	2MB	800	1x512MB	1x160GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	May 2006
8485/8490 B6y-B6x	Pentium 4 631 3.0GHz	2MB	800	2x512MB	2x160GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	May 2006
8485/8490 F2y-F2x	Pentium 4 661 3.6GHz	2MB	800	1x512MB	None/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	May 2006
8485/8490 F4y-F4x	Pentium 4 661 3.6GHz	2MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	May 2006
8485/8490 H4y-H4x	Pentium D 930 3.0GHz	4MB	800	2x512MB	2x250GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	May 2006
8485/8490 H6y-H6x	Pentium D 930 3.0GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	May 2006
8485/8490 H8y-H8x	Pentium D 930 3.0GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	May 2006
8485/8490 K2y-K2x	Pentium D 950 3.4GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	May 2006

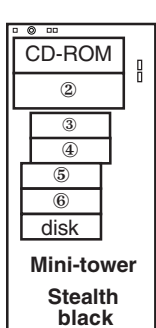|	
Positioning	*Single socket, entry server for small and medium size business' and distributed enterprises*
Processor(s)	**Intel® Pentium 4 up to 3.6GHz Single-Core 800MHz FSB / Pentium D up to 3.4GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**2MB** std on Pentium 4 / **4MB** std on Pentium D
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, some: four slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI) some: six slots(1 PCI Express x8, 1 PCI Express x1, 2 PCI, 2 PCI-X), integrated SATA and Gigabit Ethernet.
SMP support	No SMP support / no processor upgrade
Memory	**512MB or 1GB** std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered
SAS disk controller	Integrated SAS controller / supports SAS or SATA drives
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
SATA disk controller	Four channel SATA controller (3.0GB/sec) / supports 4 drives standard
Cables	One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk
Disk	Some: 160GB SATA; some: 250GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
RAID Controller	IBM ServeRAID™ 8e (RAID 0, 1) / on planar / supports SATA or SAS interface
Rack support	5U⁴ rack mount support via tower-to-rack kit option
Bus slots (see below)	All: one PCI Express® bus / one 64-bit PCIe™ x8 / one 64-bit PCIe x1/ two 32-bit 33MHz 5v PCI 2.2 slots / some: two 64-bit 66MHz 3.3v PCI-X slots / no hot-swap Active™ PCI slots
Chipset	**Intel E7230 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
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-20X⁶ CD-ROM, IDE / None standard
Ports	*Front:* two USB (2.0); *Back:* two serial (9-pin), parallel, two USB (2.0), keyboard, mouse, ethernet (RJ45) and monitor
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	
	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
Software	**ServerGuide™** (CD-based automated network OS installation and configuration tool), **ServeRAID™** (RAID management), IBM Director (system hardware management software) and many utilities	
	IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
	IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
	IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
	IBM 500GB SATA (7.2K) simple-swap HDD	39M4514
	80GB Hot-Swap SATA HDD	39M4518
	160GB Hot-Swap SATA HDD	39M4522
	250GB Hot-Swap SATA HDD	39M4526
Keyboard / mouse	Optional	
	73GB 10K 3.5" SAS Hot-Swap HDD	40K1039
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap	146GB 10K 3.5" SAS Hot-Swap HDD / 40K1040
	300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
	36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
	73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
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)	48X/32X/48X/16X Max⁶ CD-RW/DVD-ROM Combo (black) / 32R2905
	IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
	IBM 5Ux20D Tower-to-Rack Kit	39R9361
	IBM ServeRAID-7t SATA Integrated Controller	71P8648
	Other options at **ibm.com**/pc/us/accessories	

All:

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

Some:
- Slot 5: fullsize, 64-bit 66MHz, PCI-X (3.3v)
- Slot 6: fullsize, 64-bit 66MHz, PCI-X (3.3v)

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

Mini-tower

Stealth black

❖ 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

CD-ROM
②
③
④
⑤
⑥
disk

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

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

See footnotes for important warranty information

(X206mC) © IBM Corp. May 2006

IBM Machine Type model	Proccessor / Speed	L2 cache	FSB MHz	Memory	Disk/Disk controller	Maximum Capacity	PCI slots x bays	Hard disk bays	Power Supply	Ethernet	Available date
8485/8490 14U	Pentium 4 531 3.0GHz¹	1MB	800	1x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Sep 2006
8485/8490 16U	Pentium 4 531 3.0GHz	1MB	800	1x512MB	1x160GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Sep 2006
8485/8490 72U	Pentium D 820 2.8GHz	2MB	800	1x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	1x400W	Gigabit	Sep 2006
8485/8490 74U	Pentium D 820 2.8GHz	2MB	800	2x512MB	2x250GB/SATA	2.0TB	4 x 7	4 simple-swap	1x400W	Gigabit	Sep 2006
8485/8490 JAU	Pentium D 945 3.4GHz	4MB	800	2x512MB	None/SAS/SATA	1.2TB	6 x 7	4 hot-swap	2x430W	Gigabit	Sep 2006

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

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

SAS disk controller	Integrated SAS controller / supports SAS or SATA drives
IDE disk controller	Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar
SATA disk controller	Four channel SATA controller (3.0GB/sec) / supports 4 drives standard
Cables	One 2-drop EIDE cables (to CD-ROM) / one 1-drop SATA cable per installed hard disk
Disk	Some: 160GB SATA; some: 250GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T.
RAID Controller	IBM ServeRAID™ 8e (RAID 0, 1) / on planar / supports SATA or SAS interface

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

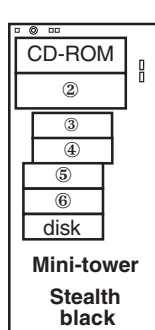|	
Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
Optical / diskette	*Some:* 48X-20X⁶ CD-ROM, IDE; *Some:* 48X-32X-48X-16X⁶ CD-RW/DVD-ROM, IDE / None standard
Ports	*Front:* two USB (2.0); *Back:* two serial (9-pin), parallel, two USB (2.0), keyboard, mouse, ethernet (RJ45) and monitor
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan speed and failure, and voltages / **secure remote power on/off** / **support for optional Remote Supervisor Adapter II**

Graphics controller	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	
	512MB PC2-4200 CL3 ECC DDR2	30R5148
	2GB(2x1GB) PC2-4200 CL3 ECC DDR2	30R5149
	4GB(2x2GB) PC2-4200 CL3 ECC DDR2	30R5150
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), **ServeRAID**™ (RAID management), IBM Director (system hardware management software) and many utilities	
	IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
	IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
	IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
	IBM 500GB SATA (7.2K) simple-swap HDD	39M4514
	80GB Hot-Swap SATA HDD	39M4518
	160GB Hot-Swap SATA HDD	39M4522
	250GB Hot-Swap SATA HDD	39M4526
Keyboard / mouse	Optional	
	73GB 10K 3.5" SAS Hot-Swap HDD	40K1039
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap	
	146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
	300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
	36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
	73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
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)	48X/32X/48X/16X Max⁶ CD-RW/DVD-ROM Combo (black) — 32R2905
	IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
	IBM 5Ux20D Tower-to-Rack Kit	39R9361
	IBM ServeRAID-7t SATA Integrated Controller	71P8648
	Other options at **ibm.com**/pc/us/accessories	

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

Some:
- Slot 5: fullsize, 64-bit 66MHz, PCI-X (3.3v)
- Slot 6: fullsize, 64-bit 66MHz, PCI-X (3.3v)

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

Mini-tower

Stealth black

❑ 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

CD-ROM
②
③
④
⑤
⑥
disk

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

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

LIMITED WARRANTY³
➥ **1 year parts and labor standard 8485 MTM**
➥ **3 year parts and labor standard 8490 MTM**
➥ **International Warranty Service³**
➥ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
➥ **On site service upgrade options (in eligible locations):⁷**
- **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9512)
- **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9511)
- **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9510)
- **3 year IOR 9x5, NBD response** (ServicePac part num 69P9509)
➥ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
➥ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

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

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

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

IDE disk controller — 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 / Cables — One SCSI cable (listed above), one 2-drop EIDE cable (to CD-ROM)
Disk - features — *Some:* 36.4GB Ultra320 SCSI / 10K rpm / 4.7 ms average read seek / S.M.A.R.T.[5]

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

Ethernet — One gigabit 10/100/1000 ethernet controller / Broadcom BCM5703i / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 1.0 / one rear RJ-45 port
CD-ROM / diskette — *CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
Ports — *Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15), microphone-in (mono), line-in (stereo), line-out (stereo)
Diagnostics — Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt cntrl — Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)

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

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

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

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

Option	Part #
Xeon 2.67 GHz/533/512KB L2 Cache Proc Upg	24P7861
Xeon 2.80 GHz/533/512KB L2 Cache Proc Upg	24P8054
Xeon 3.06 GHz/533/512KB L2 Cache Proc Upg	24P8122
2x256MB PC2100 CL2.5 ECC non-Chipkill DIMM Kit	73P2868
512MB PC2100 CL2.5 ECC DDR-SDRAM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5040
IBM 73.4GB 10K Ultra320 SCSI 68-pin (not hot-swp)	32P0724
IBM 146GB 10K Ultra320 SCSI 68-pin (not hot-swp)	32P0725
IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	06P5776
IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0727
IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0728
40X/12X/40X Max[6] CD-RW internal (black)	22P6976
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 4U Extended Depth Tower-to-Rack Kit	59P4811
IBM ServeRAID-5i Controller (adapter for Slot 4)	25P3492
IBM ServeRAID-6i Controller (adapter for Slot 4)	71P8595

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

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

CD-ROM / diskette

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

Hot-swap models only

Maximum internal SCSI disk capacity[13]:
Fixed: 587.2GB (4 disks x 146.8GB)
Hot-swap: 880.8GB (6 disks x 146.8GB)
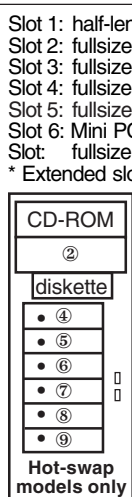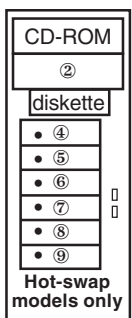
⬦ Raven black color
⬦ Removable left side panel
⬦ Configuration/Setup Utility invoked by pressing F1 at startup
⬦ BIOS Setup Utility via F1 at startup
⬦ LSI Configuration Utility near startup by pressing CTRL+C
⬦ DMI 2.2-compliant
⬦ Adv Config Power Interface (ACPI) 1.0a
⬦ *Device Driver and IBM Enhanced Diagnostics* CD-ROM included
⬦ Four stabilizing feet
⬦ Handle grip on top
⬦ H 18.4" x W 6.5" x D 26.0"
⬦ H 467mm x W 165mm x D 660mm
⬦ 44 to 57 pounds (20 to 25.8kg)
↪ *Fixed disk models:* metal cage for disk bays 4,5,6,7 rotate out of chassis for easy access for cabling
↪ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

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

(X225D) © IBM Corp. January 2004

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

Processor(s) — **1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **2MB L2 ECC Cache** / Hyper-Threading technology

SMP - L2 Cache — **2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed

Implementation — Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)

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

SATA disk controller — Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e

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

Cables — One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),

RAID Controller — IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller

Mechanical — 4U[4] Tower (rack mount support via tower-to-rack kit option)

Bus slots (see below) — One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots

Chipset — **Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface

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

CD-ROM / diskette — *CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive

Ports — *Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)

Diagnostics — Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD

Systems mgmt cntrl — Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)

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

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

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

Keyboard / mouse — IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)

Cooling fans — Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) *All:* not redundant / not hot-swap / all variable speed

Power supply(s) — *Some:* one 530 watt std and max / not redundant / not hot-swap
xBx: two 514 watt std and max / hot-swap / redundant
All: universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)

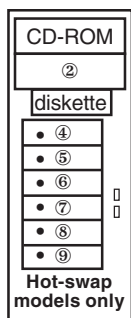|	
Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg	25R8900
Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg	25R8901
Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg	13N0676
512MB (2x256) PC2-3200 ECC DDR2	73P3523
1GB (2x512) PC2-3200 ECC DDR2	73P3522
1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit	73P2865
2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit	73P2866
IBM 80GB SATA-150 (7.2K) simple-swap HDD	73P8002
IBM 160GB SATA-150 (7.2K) simple-swap HDD	73P8003
IBM 250GB SATA-150 (7.2K) simple-swap HDD	73P8006
IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	06P5776
IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0727
IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD	32P0728
40X/12X/40X Max[6] CD-RW internal (black)	22P6976
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM 4U Extended Depth Tower-to-Rack Kit	26K6095
IBM ServeRAID-6i+ controller (adapter for Slot 5)	13N2190
IBM ServeRAID 7t SATA controller	71P8648

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

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

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

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

CD-ROM
②
diskette
• ④
• ⑤
• ⑥
• ⑦
• ⑧
• ⑨
Hot-swap models only

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

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

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

(X226B) © IBM Corp. February 2005

• = Hot-swap bays in some models

IBM® Type-GAV-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Hot-swap disk bays	PCI slots x bays	Power supply number and type	Ethernet	Available date
8648-32U-32x	1 x Xeon™	2.8	2MB	800	512MB	80GB[2] SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit	Sep 2005
8648-34U-34x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sep 2005
8648-36U-36x	1 x Xeon	2.8	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005
8648-E3U-E3x	1 x Xeon	2.8	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Sep 2005
8648-E5U-E5x	1 x Xeon	2.8	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005
8648-E7U-E7x	1 x Xeon	3.2	2MB	800	2GB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Sep 2005
8648-B2U-B2x	1 x Xeon	3.0	2MB	800	512MB	80GB SATA 7200	SATA	4 simple-swap	6 x 7	One fixed	Gigabit	Apr 2006
8648-B4U-B4x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	One fixed	Gigabit	Apr 2006
8648-B6U-B6x	1 x Xeon	3.0	2MB	800	512MB	None (open-bay)	Ultra320	6 hot-swap	6 x 9	Two redundant	Gigabit	Apr 2006

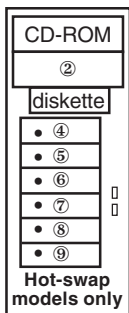|	
Processor(s)	**1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB) / EM64T / 2MB L2 ECC Cache** / Hyper-Threading technology
SMP - L2 Cache	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)
Memory	**512MB** std / 16GB[13] max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater
SATA disk controller SCSI disk controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e **Adaptec® 7902 / dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector
Cables	One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM),
RAID Controller	IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Mechanical	4U[4] Tower (rack mount support via tower-to-rack kit option)
Bus slots (see below)	One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots
Chipset	**Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
Ethernet	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port
CD-ROM / diskette	*CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive
Ports	*Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15)
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt cntrl	Winbond® W791D / chip on planar / monitors system and processor temperature, fan speed and failure, and voltages / **support for optional Remote Supervisor Adapter II** (provides continuous health monitoring and control)
Graphics controller	SVGA / ATI® Radeon™7000M on Planar / 16MB SDRAM std and max / 15 pin connector

Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities
Keyboard / mouse	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2)
Cooling fans	Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) *All:* not redundant / not hot-swap / all variable speed
Power supply(s)	*Some:* one 530 watt std and max / not hot-swap *Some:* two 514 watt std and max / hot-swap / redundant *All:* universal / voltage-sensing / Automatic Server Restart (ASR) / cooling fan in power supply(s) (variable spd)

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

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

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

CD-ROM
②
diskette
• ④
• ⑤
• ⑥
• ⑦
• ⑧
• ⑨
Hot-swap models only

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

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

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

See footnotes for important warranty information

• = Hot-swap bays in some models

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

Processor(s) SMP - L2 Cache Implementation	**1 x Intel® Xeon up to 3.4 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **2MB L2 ECC Cache** / Hyper-Threading technology **2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, six DIMM slots, six slots (3 PCI-X, 2 PCI, 1 PCI Express x16)
Memory	**512MB** std / 16GB[13] max (16GB maximum can be achieved when 4GB DIMMs are supported, 12GB is the maximum with less than 4GB DIMMs) / two slots used / four slots available / **PC2-3200** 400MHz ECC DDR2-SDRAM DIMMs / Six 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) available on 1GB (2x512) DIMM Kit and greater
SATA disk controller SCSI disk controller Cables RAID Controller	Dual Channel SATA-150 controller (150MB/sec / two connectors on planar /supports ServeRAID™ 7e **Adaptec® 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / ServeRAID 7e supports **RAID-0 & 1 mirroring** / Two 16-bit channels (one internal and one external) / *Internal channel:* Hot-swap models: one 1-drop 16-bit 68-pin LVD SCSI cable to 6-bay backplane; *External channel:* cable available as option pn 24P7929 from systemboard to rear external 68-pin connector One SCSI cable (listed above), two one-drop SATA, one 2-drop EIDE cable (to CD-ROM), IBM ServeRAID 7e (RAID 0 0r 1) / on planar / supports SATA or SCSI interface / supports ServeRAID 6i+ controller
Mechanical Bus slots (see below) Chipset	4U[4] Tower (rack mount support via tower-to-rack kit option) One PCI-Express / three 64-bit (one 133MHz, 2 100MHz) PCI-X 1.0 / two 32-bit/33MHz / no hot-swap Active™ PCI slots **Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express x16(vid), Broadcom, PXH, ICH5R / PXH BUS A supports Adaptec 7902, 2 64bit/100MHz PCI-X slots (5 & 6), BUS B supports one 64bit/133MHz PCI-X slot (4) / ICH5R for two 32-bit/33MHz PCI slots (slots 2 & 3), video, SATA, 4xUSB(2.0), Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
Ethernet CD-ROM / diskette Ports Diagnostics Systems mgmt cntrl Graphics controller	One gigabit 10/100/1000 ethernet controller / Broadcom 5721 / full gigabit ethernet MAC and PHY layer functions / chip on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / one rear RJ-45 port *CD-ROM:* 48X-20X[6] CD-ROM, IDE / *Diskette:* 3.5" 1.44MB diskette drive *Front:* two USB (Ver 2.0); *Back:* two USB (Ver 2.0), two serial (9-pin), parallel, keyboard, mouse, ethernet (RJ-45), monitor (analog DB-15) 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) SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector

Security	Mechanical side panel key lock (locks hot-swap disks on hot-swap models) / optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse / security slot (for opt cable lock)	Xeon 2.8 GHz/800/2MB L2 Cache EM64TProc Upg 40K2500
		Xeon 3.0 GHz/800/2MB L2 Cache EM64TProc Upg 40K2515
		Xeon 3.2 GHz/800/2MB L2 Cache EM64TProc Upg 40K2516
		Xeon 3.4 GHz/800/2MB L2 Cache EM64TProc Upg 40K2517
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware mgmt software) and many utilities	512MB (2x256) PC2-3200 ECC DDR2 73P3523
		1GB (2x512) PC2-3200 ECC DDR2 39M5818
		1GB (2x512) PC2-3200 ECC DDR2 ChipK DIMM Kit 39M5821
		2GB (2x1GB) PC2-3200 ECC DDR2 DIMM Kit 39M5809
Keyboard / mouse Cooling fans Power supply(s)	IBM 101 key keyboard / IBM mouse (both black, 6-pin PS/2) Up to six / three for processor(s), memory, and disk bays / two power supply cage fans (three in dual power supply model) 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)	IBM 80GB SATA-150 (7.2K) simple-swap HDD 40K6864
		IBM 160GB SATA-150 (7.2K) simple-swap HDD 40K6868
		IBM 250GB SATA-150 (7.2K) simple-swap HDD 40K6872
		IBM 36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD 30R5096
		IBM 73GB 10K Ultra320 SCSI Hot-Swap SL HDD 40K1023
		IBM 146GB 10K Ultra320 SCSI Hot-Swap SL HDD 40K1024
		48X/32X/48X Max[6] CD-RW internal (black) 22P7042
		IBM Remote Supervisor Adapter II (PCI adapter) 59P2984
		IBM 4U Extended Depth Tower-to-Rack Kit 26K6095
		IBM ServeRAID-6i+ controller (adapter for Slot 5) 13N2190
		IBM ServeRAID 7t SATA controller 71P8648

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

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

CD-ROM
②
diskette
• ④
• ⑤
• ⑥
• ⑦
• ⑧
• ⑨
Hot-swap models only

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

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

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

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

See footnotes for important warranty information

(X226D) © IBM Corp. April 2006

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

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

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

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

Option	Part
Xeon 2.67GHz/512KB L2 Cache Proc Upg	71P8966
Xeon 2.8BGHz/512KB L2 Cache Proc Upg	71P8967
Xeon 3.06GHZ/512KB L2 Cache Proc Upg	02R1988
2x256MB PC2100 Non-Chipkill DDR-SDRAM Kit	73P2868
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
IBM ServeRAID-6i Controller (adapter for slot 4)	71P8595
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
36.4GB 15K-2 80 Ultra320 SCSI Hot-Swap SL HDD	06P5776
3-Pack Ultra320 Hot-Swap Expansion Kit	33P2751
IBM 560W Hot-Swap Power Upgrade Kit*	02R1874
IBM 660W Hot-Swap Power Upgrade Kit (3.06 Only)	02R2015

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

Keyboard / mouse	IBM 101-key keyboard / IBM mouse (both black)	
Power supply	*MAX*: std/max: two/two 660 watt *M1X*: std/max: one/two 660 watt *xAX*: std/max: two/two 560 watt *Rest*: std/max: one/two 560 watt	*All:* voltage-sensing / auto-restart / fan in each
Fans	Four fans and two blowers / variable speed / hot-swap / redundant / PFA / fan in each power supply	

Slot 1: full, 32-bit 33MHz 5v PCI 2.2, Bus A
Slot 2: full, 64-bit 100MHz 3.3v PCI-X, not hot, Bus B
Slot 3: full, 64-bit 100MHz 3.3v PCI-X, not hot, Bus B
Slot 4: full, 64-bit 100MHz 3.3v PCI-X, not hot, Bus B*
Slot 5: full, 64-bit 133MHz 3.3v PCI-X, hot-swap, Bus C
Slot 6: full, 64-bit 133MHz 3.3v PCI-X, hot-swap, Bus C
* Extended slot for opt IBM ServeRAID-5i Controller
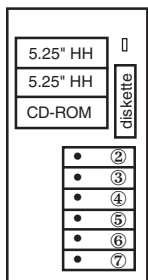
Bay ①	3.5",	SL 1",	access,	diskette
Bay ②	3.5",	SL 1",	access,	hot-swap
Bay ③	3.5",	SL 1",	access,	hot-swap
Bay ④	3.5",	SL 1",	access,	hot-swap
Bay ⑤	3.5",	SL 1",	access,	hot-swap
Bay ⑥	3.5",	SL 1",	access,	hot-swap
Bay ⑦	3.5",	SL 1",	access,	hot-swap
Bay ⑧	5.25",	HH 1.6"	access,	open**
Bay ⑨	5.25",	HH 1.6"	access,	open**
Bay ⑩	5.25",	HH 1.6"	access,	CD-ROM

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

Tower

5.25" HH
5.25" HH
CD-ROM
diskette

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

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

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

• = Hot-swap

(X235C) © IBM Corp. January 2004

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

Positioning	*Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
Processor	Up to **1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6, 3.8 GHz** with 800MHz frontside bus / **Extended Memory 64 Technology (EM64T)** / **Simultaneous Multi-threading** (SMT) / Hyper-Threading technology /
L2 cache	**2MB** / all models / on die of processor / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, eight memory gold-connector DIMM slots, six PCI slots (one hot-swap Active™ PCI slots), and integrated SCSI, ethernet, graphics
Memory	**1GB** std / 16GB max / two slots used / six slots available / **PC2-3200** 400MHz registered 240-pin ECC **DDR2**-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2x200MHz / **Error Checking and Correcting (ECC)** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / **Active Memory™: memory mirroring, online-spare memory**
SCSI disk controller	**Adaptec AIC 7902** / **dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / **HostRAID** supports **RAID-0, 1 mirroring** with up to one hot-spare disk / optional IBM ServeRAID™-7k Controller for low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10, 50 (installed on internal connector)
SCSI channels	Two 16-bit channels / *SCSI Channel B:* 16-bit 68-pin LVD cable from controller to backplane; *Channel A:* 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 24P7973) or via opt ServeRAID adapter with external connector(s)
IDE controller / cable	Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)
Disk - capacity	None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks
Mechanical	Tower / conversion to EIA 19" Rack (5U⁴) via optional kit for support in IBM NetBAY™ Racks (13N0956)
Slots	Two PCI-Express (one hot-plug), three PCI-X 64-bit (one 133MHz and two 100MHz), one 32-bit/33MHz slot
Chipset (see below)	**Intel E7520 chipset** / Intel E7520 Memory Controller Hub (MCH): PXH, ICH5R, Dual Broadcom ethernet, two PCI-Express x8 slots (slots 2 & 3) / PXH: Bus A, two 64-bit/100MHz PCI-X slots (slots 4 & 5), Adaptec SCSI Bus B, one 64-bit/133MHz Hot-Plug slot (slot 6) / ICH5R: one 32-bit/33MHz slot (slot 1), ATI video, EIDE, USB, SMBus, LPC bus to Super I/O / NS PC87417 Super I/O
Ethernet controller	**Dual** 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format (2.0) / IPMI (1.5)
CD-ROM / diskette	48X-20X⁶ CD-ROM / IDE / 1.6" HH; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin), graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)
Front port / graphics	*Front:* one USB (Vers 2.0); *Graphics:* SVGA / ATI® Radeon™ 7000M / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2

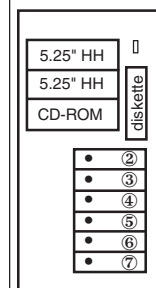|		
Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot	
	Xeon 2.8GHz/2MB L2 Cache Proc Upg	40K2503
	Xeon 3.0GHz/2MB L2 Cache Proc Upg	40K2504
	Xeon 3.2GHz/2MB L2 Cache Proc Upg	40K2505
Systems mgmt	**IBM Integrated system management processor** (ISMP) /	Xeon 3.4GHZ/2MB L2 Cache Proc Upg · 40K2506
	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)	Xeon 3.6GHz/2MB L2 Cache Proc Upg · 40K2507
		Xeon 3.8GHz/2MB L2 Cache Proc Upg · 40K2508
		512MB (2x256) PC2-3200 CL3 ECC DDR2 non-Chipk · 73P3523
		1GB (2x512) PC2-3200 CL3 ECC DDR2 non-Chipk · 39M5818
Diagnostics	**Light Path Diagnostics™** panel providing LED map to failing part (under side cover) / Information LED Panel in front	1GB (2x512) PC2-3200 CL3 ECC DDR2 RDIMM · 39M5821
		2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM · 39M5809
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, others	73.4GB 10K Ultra320 SCSI Hot-Swap SSL HDD · 40K1023
		146.4GB 10K Ultra320 SCSI Hot-Swap SSL HDD · 40K1024
		73.4GB 15K Ultra320 SCSI Hot-Swap SSL HDD · 30R5097
Keyboard / mouse	IBM 101-key keyboard / IBM mouse (both black)	IBM ServeRAID-7k Controller · 71K8642
Power supply	std/max: one/two 670 watt / voltage-sensing / auto-restart /	IBM Remote Supervisor Adapter II Slimline · 73P9341
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	3-Pack Ultra320 Hot-Swap Expansion Kit · 33P2751
		IBM 670W Hot-Swap Power Upgrade Kit (NA) · 25K9560
		Other options at **www.ibm.com**/pc/us/accessories

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

5.25" HH	Bay ① 3.5", SL 1", access, diskette
5.25" HH	Bay ② 3.5", SL 1", access, hot-swap
CD-ROM	Bay ③ 3.5", SL 1", access, hot-swap

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

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

Tower

⇨ 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: 1.8TB² with six 300GB Ultra160 or Ultra320 SCSI hot-swap slimline HDDs

LIMITED WARRANTY³
⇨ **3 year parts and labor**
⇨ **International Warranty Service³**
⇨ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
⇨ **3 year on site warranty service upgrade options (in eligible locations):⁷**
  • **9 hour coverage, Mon-Fri excluding holidays, 4 hour average response** (ServicePac® part num 21P2083)
  • **24 hr x 7 day coverage, 4 hour average response** (ServicePac part number 21P2084)
  • **24 hr x 7 day coverage, 2 hour average response** (ServicePac part number 21P2085)
⇨ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

See footnotes for important warranty information   • = Hot-swap   (X236B) © IBM Corp. September 2005

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

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

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

SCSI disk controller	**Adaptec AIC 7902 / dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / **HostRAID** supports **RAID-0, 1 mirroring** with up to one hot-spare disk / optional IBM ServeRAID™-7k Controller for low-cost RAID 0, 1, 1E, 1E0, 5, 00, 10, 50 (installed on internal connector)
SCSI channels	Two 16-bit channels / *SCSI Channel B:* 16-bit 68-pin LVD cable from controller to backplane; *Channel A:* 16-bit 68-pin interface for Bay 8 and 9 (may require a cable) or with optional 3-Pack Kit (cable included); supports external SCSI devices via external SCSI knockout in rear (cable req 24P7973) or via opt ServeRAID adapter with external connector(s)
IDE controller / cable	Enhanced IDE ATA-100 controller in ICH5R South Bridge / one connector on planar / one 1-drop IDE cable (CD-ROM)
Disk - capacity	None std / supports 7200-15000 rpm disks / one backplane / all disk bays Ultra320-enabled
Disk - bays	Six hot-swap / 80-pin SCA-2 connectors / three additional hot-swap bays with Kit 33P2751 for up to nine 15K rpm disks

Mechanical	Tower / conversion to EIA 19" Rack (5U[4]) via optional kit for support in IBM NetBAY™ Racks (13N0956)
Slots	Two PCI-Express (one hot-plug), three PCI-X 64-bit (one 133MHz and two 100MHz), one 32-bit/33MHz slot
Chipset (see below)	**Intel E7520 chipset** / Intel E7520 Memory Controller Hub (MCH): PXH, ICH5R, Dual Broadcom ethernet, two PCI-Express x8 slots (slots 2 & 3) / PXH: Bus A, two 64-bit/100MHz PCI-X slots (slots 4 & 5), Adaptec SCSI Bus B, one 64-bit/133MHz Hot-Plug slot (slot 6) / ICH5R: one 32-bit/33MHz slot (slot 1), ATI video, EIDE, USB, SMBus, LPC bus to Super I/O / NS PC87417 Super I/O

Ethernet controller	**Dual** 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format (2.0) / IPMI (1.5)
CD-ROM / diskette	48X-20X[6] CD-ROM / IDE / 1.6" HH; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin),graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)
Front port / graphics	*Front:* one USB (Vers 2.0); *Graphics:* SVGA / ATI® Radeon™ 7000M / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2

Security	Power-on password / administrator password / hinged and lockable front door to cover disk bays, power button, and reset button / unattended boot / selectable boot
Systems mgmt	**IBM Integrated system management processor** (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 20-pin connector on planar for continuous power **(std on 32y)** (no ext pwr reqd)
Diagnostics	**Light Path Diagnostics™** panel providing LED map to failing part (under side cover) / Information LED Panel in front
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, others
Keyboard / mouse	IBM 101-key keyboard / IBM mouse (both black)
Power supply	std/max: one/two 670 watt / voltage-sensing / auto-restart /
Fans	Fan in each std/max: four/six/ two fans (front), two fans on planar, (Opt) two fans (rear) / variable speed / hot-swap / redundant with optional rear fans / PFA / fan in each power supply

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

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

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

⇨ 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

5.25" HH	
5.25" HH	
CD-ROM	diskette

② ③ ④ ⑤ ⑥ ⑦

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

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

Tower

All models: Max int disk capacity: 1.8TB[2] with six 300GB Ultra160 or Ultra320 SCSI hot-swap slimline HDDs

LIMITED WARRANTY[3]

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

See footnotes for important warranty information   • = Hot-swap   (X236C) © IBM Corp. April 2006

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

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

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

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

7U[4] **Rack or Tower**
Light Path Diag
Removable Processor Board Tray
• Opt disk   • Opt disk   Floppy Drive
• Opt disk   • Opt disk
• Opt disk   • Opt disk   CD-ROM
• Opt disk   • Opt disk
• Opt disk   • Opt disk   Full High Tape Bay
• Opt disk   • Opt disk   or 2 Half High Bays

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

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

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

See footnotes for important warranty information   • = Hot-swap

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

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

Options

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

LIMITED WARRANTY[3]

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

7U[4] Rack or Tower

Light Path Diag
Removable Processor Board Tray
• Opt disk • Opt disk Floppy Drive
• Opt disk • Opt disk CD-ROM
• Opt disk • Opt disk
• Opt disk • Opt disk Full High Tape Bay
• Opt disk • Opt disk or 2 Half High Bays
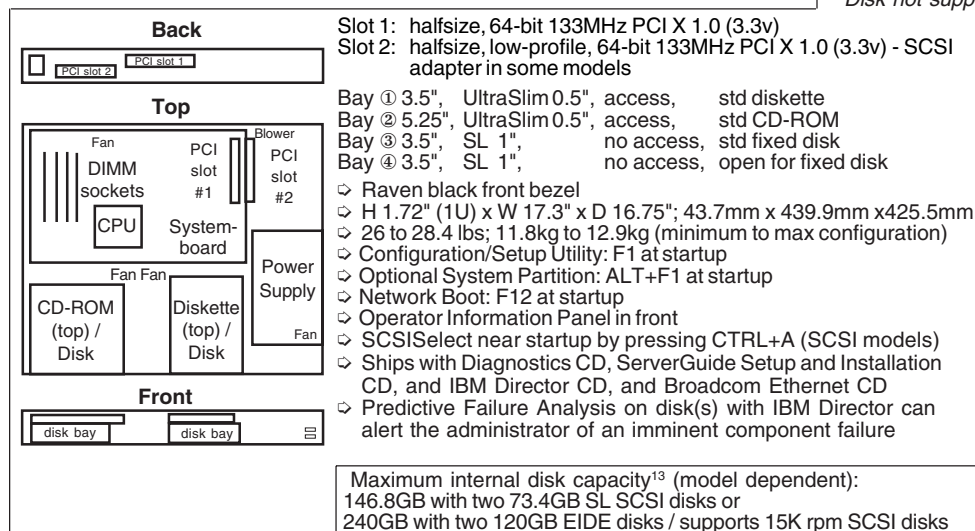• Opt disk • Opt disk

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

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

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

See footnotes for important warranty information   • = Hot-swap

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

Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium 4 up to 2.8BGHz**[1] with 533MHz frontside bus (FSB)
L2 cache	**512KB** / on die of processor / at processor speed (no L3 cache)
SMP support	No SMP support
Implementation	Systemboard contains one Intel mPGA478B socket (with Pentium 4 FC-PGA2 and heatsink), four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated chipset, two EIDE connectors, ethernet, and graphics

Memory	**256MB** std / 4GB max[13] / one slot used / three slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / memory bus runs at 2 x 133MHz / **Error Checking and Correcting (ECC)** memory controller

SCSI disk controller	*SCSI models:* **Adaptec® 29160LP / single channel Wide Ultra160 SCSI** (LVD 160MB/sec) / 64-bit 66MHz PCI adapter / one channel with up to 15 device support
SCSI connectors	*SCSI models:* On adapter: one 68-pin SCSI connector
IDE disk controller	Enhanced IDE busmaster / ATA-100 support / two connectors on systemboard
Cables	*SCSI models:* one 2-drop 16-bit LVD SCSI cable, one 1-drop 40-conductor EIDE cable (connected to CD-ROM) *EIDE models:* one 2-drop EIDE cable (to CD-ROM and disk), one 1-drop EIDE cable (to second disk bay)
Disk - features	*SCSI:* 18.2GB/36.4GB Ultra160 SCSI, 10K rpm, 5.2ms read seek; *EIDE:* 40GB ATA-100, 7200 rpm, 8.7ms read; *All:* S.M.A.R.T.[5]

Mechanical	**EIA 19" Rack (1U**[4]**)** / rack-mount only / supports 16.75" deep racks for telco and colocation implementations
Architecture / chipsets	**ServerWorks® Grand Champion™ SL** / CMIC-SL (Super Lite) Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB bus to Host Bridge for PCI-X Bus A with slots and PCI-X Bus B with dual ethernet) / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2-based graphics controller, EIDE, USB, LPC bus to Super I/O) / National Semiconductor® PC87414 Super I/O chip (serial, keyboard, mouse, diskette)
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots

Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom® BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / PXE / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM / diskette	24X-10X[6] CD-ROM / IDE; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* serial (9-pin), two ethernet (RJ-45), keyboard, mouse, analog DB-15 monitor / no parallel port
Front ports / graphics	*Front:* two USB (Vers 1.1); *Graphics:* SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)

Systems mgmt	WinBond® W83791D / on planar / monitors system and processor temperature, fan speed and failure, and voltages
Diagnostics	Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter with 20-pin conn on planar for continuous power (no external power required)

Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	Five fans (three fans for system, one blower in rear, one on power supply) / variable speed / not redundant or hot-swap
Power supply	200 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, operating system / supports IBM ACT CAT-5 chaining solutions

Option	Part number
256MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5037
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
120GB ATA-100 EIDE HDD (7200 rpm)*	09N4231
18.2GB 15K Ultra160 SCSI SL 68-pin HDD*	06P5765
36.4GB 15K Ultra160 SCSI SL 68-pin HDD*	06P5766
73.4GB 10K Ultra160 SCSI SL 68-pin HDD*	06P5752
Remote Supervisor Adapter	09N7585
ServeRAID™-4Lx Ultra160 SCSI Adapter	06P5740
IBM T541 15" Flat Panel Color Monitor (black)	9512AB1
IBM NetBAY25 Standard Rack	9306250
IBM NetBAY42 Enterprise Rack	930842S
IBM ACT Local Console Manager	1735L04

Other options at **ibm.com**/pc/us/accessories
* Disk not supported in all x305 systems

Back

PCI slot 1
PCI slot 2

Top

Fan / DIMM sockets / CPU / PCI slot #1 / Blower / PCI slot #2 / System-board / Fan Fan / CD-ROM (top) / Disk / Diskette (top) / Disk / Power Supply / Fan

Front

disk bay   disk bay

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

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

- ⇨ Raven black front bezel
- ⇨ H 1.72" (1U) x W 17.3" x D 16.75"; 43.7mm x 439.9mm x425.5mm
- ⇨ 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
- ⇨ Configuration/Setup Utility: F1 at startup
- ⇨ Optional System Partition: ALT+F1 at startup
- ⇨ Network Boot: F12 at startup
- ⇨ Operator Information Panel in front
- ⇨ SCSISelect near startup by pressing CTRL+A (SCSI models)
- ⇨ Ships with Diagnostics CD, ServerGuide Setup and Installation CD, and IBM Director CD, and Broadcom Ethernet CD
- ⇨ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

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

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

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

IBM @server™ xSeries™ 306m

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

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

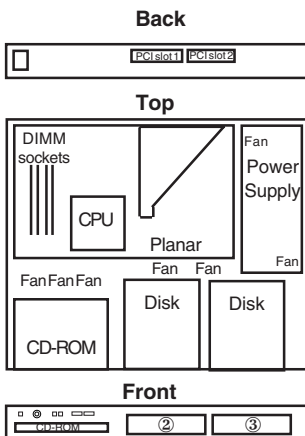|	
Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium 4 up to 3.6GHz Single Core 800MHz FSB / Pentium D 3.0GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**Up to 2MB** std on Pentium 4 / **2x1MB** std on Pentium D / ECC / full speed
SMP support	No SMP support
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two slots: some: (1 PCI Express x8, 1 PCI-X) some: (2 PCI-X)
Memory	**512MB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered
SCSI disk controller	*SAS models:* **Adaptec® 9405 chipset** / single channel / on planar / Integrated Raid 8e (Raid 0 or 1)
SATA disk controller	*SATA models:* Integrated Intel controller / two-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
IDE disk controller	Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Cables	*SAS models:* one 1-drop EIDE cable (connected to CD-ROM)
	SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to CD-ROM)
Disk	None standard
Mechanical	**EIA 22" Rack (1U[4])** / rack-mount only
Architecture / chipsets	**Intel E7210 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
Bus slots	(See below) two available PCI-X 1.0 100MHz or one 64-bit PCI-E x8 and one PCI-X 1.0 100MHz / no hot-swap Active™ PCI slots /
Ethernet controllers	**Dual Gigabit** 10/100/1000 ethernet ports / Broadcom 5721 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)
CD-ROM / diskette	24X-10X[6] CD-ROM Slim/ IDE; *Diskette:* none
Rear ports	*Rear:* serial (9-pin), two ethernet (RJ-45),keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)
Front ports /	*Front:* two USB (Vers 2.0)
Graphics	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz
Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages
Diagnostics	Diagnostic LEDS/ Error LEDS for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter II with 20-pin conn on planar for continuous power (no external power required)

Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / **secure remote power on / off via IPMI 1.5**	
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™ and others	
Cooling fans	Seven fans (five fans for system, two on power supply) / variable speed / not redundant or hot-swap	
Power supply	350 watt / universal / auto-sensing / auto-restart support	
Prerequisites	Monitor, keyboard, mouse, rack	

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

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

Back

PCI slot 1 PCI slot 2

Top

DIMM sockets | Fan | Power Supply
CPU | Planar
Fan Fan Fan | Fan Fan | Fan
Disk | Disk
CD-ROM

Front

CD-ROM ② ③

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

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

➢ Raven black front bezel
➢ H 1.75" (1U) x W 17.3" x D 22"; 43mm x 440mm x 559mm
➢ 24.25 to 30 lbs; 11kg to 12.7kg (minimum to max configuration)
➢ Configuration/Setup Utility: F1 at startup
➢ Network Boot: F12 at startup
➢ Operator Information Panel in front
➢ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
➢ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

LIMITED WARRANTY[3]

➥ **1 year parts and labor standard 8849 MTM**
➥ **3 year parts and labor standard 8491 MTM**
➥ **International Warranty Service**[3]
➥ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
➥ **On site service upgrade options (in eligible locations):**[7]
  • **3 year IOR 9x5, NBD avg response** (ServicePac part num 69P9505)
  • **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9506)
  • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
  • **3 year IOR 24x7, 2 hr response** (ServicePac part num 69P9508)
➥ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
➥ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

See footnotes for important warranty information

(X306mA) © IBM Corp. October 2005

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

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

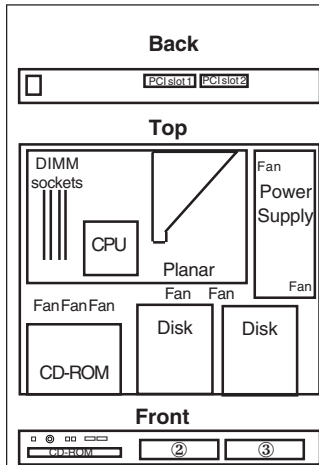|	
Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium 4 up to 3.0GHz Single-Core 800MHz FSB / Pentium D up to 3.2GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**2MB** std on Pentium 4 / **4MB** std on Pentium D / ECC / full speed
SMP support	No SMP support
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two slots: some: (1 PCI Express® x8, 1 PCI-X) some: (2 PCI-X)
Memory	**512MB or 1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one socket used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered
SCSI disk controller	*SAS models:* **Adaptec® 9405 chipset** / single-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
SATA disk controller	*SATA models:* Integrated Intel controller / two-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
IDE disk controller	Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Cables	*SAS models:* one 1-drop EIDE cable (connected to CD-ROM)
	SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to CD-ROM)
Disk	None standard
Mechanical Architecture / chipsets	**EIA 22" Rack (1U[4])** / rack-mount only
	Intel E7210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
Bus slots	(See below) two available PCI-X 1.0 100MHz or one 64-bit PCIe™ x8 and one PCI-X 1.0 100MHz / no hot-swap Active™ PCI slots /
Ethernet controllers	**Dual-Gigabit** 10/100/1000 ethernet ports / Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)
CD-ROM / diskette	24X-10X[6] CD-ROM Slim/ IDE; *Diskette:* none
Rear ports	*Rear:* serial (9-pin), two ethernet (RJ-45),keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)
Front ports /	*Front:* two USB (Vers 2.0)
Graphics	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz
Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages
Diagnostics	Diagnostic LEDS/ Error LEDS for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter II with 20-pin conn on planar for continuous power (no external power required)

Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / **secure remote power on / off via IPMI 1.5**	
		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
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™ and others	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
Cooling fans	Seven fans (five fans for system, two on power supply) / variable speed / not redundant or hot-swap	250GB Hot-Swap SATA HDD — 39M4526
		73GB 10K 3.5" SAS Hot-Swap HDD — 40K1039
		146GB 10K 3.5" SAS Hot-Swap HDD — 40K1040
Power supply	350 watt / universal / auto-sensing / auto-restart support	300GB 10K 3.5" SAS Hot-Swap HDD — 40K1041
Prerequisites	Monitor, keyboard, mouse, rack	36GB 15K 3.5" SAS Hot-Swap HDD — 40K1042
		73GB 15K 3.5" SAS Hot-Swap HDD — 40K1043
		146GB 15K 3.5" SAS Hot-Swap HDD — 40K1044
		IBM Remote Supervisor Adapter II (PCI adapter) — 59P2984
		IBM ServeRAID-7t SATA Integrated Controller — 71P8648

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

Back

PCI slot 1 PCI slot 2

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

Top

DIMM sockets
Fan
Power Supply
CPU
Planar
Fan Fan
Fan Fan Fan
Disk
Disk
Fan
CD-ROM

Front

CD-ROM   ②   ③

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

▷ Raven black front bezel
▷ H 1.75" (1U) x W 17.3" x D 22"; 43mm x 440mm x 559mm
▷ 24.25 to 30 lbs; 11kg to 12.7kg (minimum to max configuration)
▷ Configuration/Setup Utility: F1 at startup
▷ Network Boot: F12 at startup
▷ Operator Information Panel in front
▷ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
▷ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure
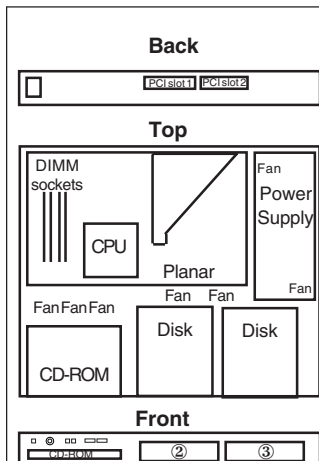
LIMITED WARRANTY[3]
➥ **1 year parts and labor standard 8849 MTM**
➥ **3 year parts and labor standard 8491 MTM**
➥ **International Warranty Service**[3]
➥ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
➥ **On site service upgrade options (in eligible locations):**[7]
• **3 year IOR 9x5, NBD avg response** (ServicePac part num 69P9505)
• **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9506)
• **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
• **3 year IOR 24x7, 2 hr response** (ServicePac part num 69P9508)
➥ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
➥ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

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

IBM Machine Type GAV model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mech-anical	Slots x bays	Ethernet	Ltd warr[3]	Available date
8849/8891 K2y-K2x	Pentium® D 950 3.4GHz/DC	4MB	800	2 x 512MB	SATA	2 simple-swap	1U[4] rack	2x3	Dual GB	1/3yr	May 2006
8849/8891 K4y-K4x	Pentium D 950 3.4GHz/DC	4MB	800	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	May 2006
8849/8891 94y-94x	Pentium D 960 3.6GHz/DC	4MB	800	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	May 2006

Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium D up to 3.6GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**4MB** std on Pentium D / ECC / full speed
SMP support	No SMP support
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two slots: some: (1 PCI Express® x8, 1 PCI-X) some: (2 PCI-X)
Memory	**1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / two sockets used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered
SCSI disk controller	*SAS models:* **Adaptec® 9405 chipset** / single-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
SATA disk controller	*SATA models:* Integrated Intel controller / two-channel / on planar / Integrated Raid 8e (Raid 0 or 1)
IDE disk controller	Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Cables	*SAS models:* one 1-drop EIDE cable (connected to CD-ROM)
	SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to CD-ROM)
Disk	None standard
Mechanical Architecture / chipsets	**EIA 22" Rack (1U[4])** / rack-mount only
	Intel E7210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
Bus slots	(See below) two available PCI-X 1.0 100MHz or one 64-bit PCIe™ x8 and one PCI-X 1.0 100MHz / no hot-swap Active™ PCI slots /
Ethernet controllers	**Dual-Gigabit** 10/100/1000 ethernet ports / Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)
CD-ROM / diskette	24X-10X[6] CD-ROM Slim/ IDE; *Diskette:* none
Rear ports	*Rear:* serial (9-pin), two ethernet (RJ-45),keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)
Front ports /	*Front:* two USB (Vers 2.0)
Graphics	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz
Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages
Diagnostics	Diagnostic LEDS/ Error LEDS for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter II with 20-pin conn on planar for continuous power (no external power required)

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

512MB PC2-4200 CL3 ECC DDR2RoHS	30R5148
2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5149
4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
80GB Hot-Swap SATA HDD	39M4518
160GB Hot-Swap SATA HDD	39M4522
250GB Hot-Swap SATA HDD	39M4526
73GB 10K 3.5" SAS Hot-Swap HDD	40K1039
146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
146GB 15K 3.5" SAS Hot-Swap HDD	40K1044
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM ServeRAID-7t SATA Integrated Controller	71P8648

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

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

Back

PCI slot 1 PCI slot 2

Top

DIMM sockets
CPU
Planar
Fan Fan Fan
CD-ROM
Disk
Disk
Fan Fan
Fan
Power Supply
Fan

Front

CD-ROM ② ③

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

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

⇨ Raven black front bezel
⇨ H 1.75" (1U) x W 17.3" x D 22"; 43mm x 440mm x 559mm
⇨ 24.25 to 30 lbs; 11kg to 12.7kg (minimum to max configuration)
⇨ Configuration/Setup Utility: F1 at startup
⇨ Network Boot: F12 at startup
⇨ Operator Information Panel in front
⇨ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
⇨ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure
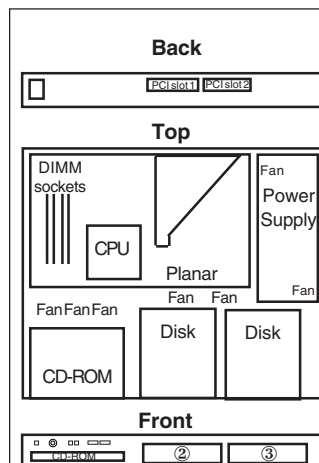
LIMITED WARRANTY[3]
- **1 year parts and labor standard 8849 MTM**
- **3 year parts and labor standard 8491 MTM**
- **International Warranty Service**[3]
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **On site service upgrade options (in eligible locations):**[7]
  - **3 year IOR 9x5, NBD avg response** (ServicePac part num 69P9505)
  - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9506)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
  - **3 year IOR 24x7, 2 hr response** (ServicePac part num 69P9508)
- **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
- **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

See footnotes for important warranty information

IBM Machine Type model	Processor / Speed	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mech- anical	Slots x bays	Ethernet	Ltd warr[3]	Available date
8849/8891 FAU	Pentium® D 915 2.8GHz/DC	4MB	800	2 x 512MB	SATA	2 simple-swap	1U[4] rack	2x3	Dual GB	1/3yr	Sep 2006
8849/8891 JAU	Pentium D 945 3.4GHz/DC	4MB	800	2 x 512MB	SATA	2 simple-swap	1U rack	2x3	Dual GB	1/3yr	Sep 2006
8849/8891 JBX	Pentium D 945 3.4GHz/DC	4MB	800	2 x 512MB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual GB	1/3yr	Sep 2006

Positioning	*A highly affordable, uni-processor, 1U rack-optimized server*
Processor(s)	**Intel® Pentium D up to 3.4GHz Dual-Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**4MB** std on Pentium D / ECC / full speed
SMP support	No SMP support
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two slots: some: (1 PCI Express® x8, 1 PCI-X) some: (2 PCI-X)

Memory	**1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / two sockets used / **PC2-4200 533MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

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

Mechanical Architecture / chipsets	**EIA 22" Rack (1U[4])** / rack-mount only
	Intel E7230 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH-S) for PCI 2.2 and PCI-X bus, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® LPC47M192 Super I/O for diskette, parallel, serial, keyboard, mouse
Bus slots	(See below) two available PCI-X 1.0 100MHz or one 64-bit PCIe™ x8 and one PCI-X 1.0 100MHz / no hot-swap Active™ PCI slots /

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

CD-ROM / diskette	24X-10X[6] CD-ROM Slim/ IDE; *Diskette:* none
Rear ports	*Rear:* serial (9-pin), two ethernet (RJ-45),keyboard, mouse, analog DB-15 monitor / no parallel port / two USB (Vers 2.0)
Front ports /	*Front:* two USB (Vers 2.0)
Graphics	ATI® RN50(ES1000) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages
Diagnostics	Diagnostic LEDS/ Error LEDS for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional Remote Supervisor Adapter II with 20-pin conn on planar for continuous power (no external power required)

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

512MB PC2-4200 CL3 ECC DDR2RoHS	30R5148
2GB(2x1GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5149
4GB(2x2GB) PC2-4200 CL3 ECC DDR2 RoHS	30R5150
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
80GB Hot-Swap SATA HDD	39M4518
160GB Hot-Swap SATA HDD	39M4522
250GB Hot-Swap SATA HDD	39M4526
73GB 10K 3.5" SAS Hot-Swap HDD	40K1039
146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
146GB 15K 3.5" SAS Hot-Swap HDD	40K1044
IBM Remote Supervisor Adapter II (PCI adapter)	59P2984
IBM ServeRAID-7t SATA Integrated Controller	71P8648

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

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

Back

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

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

⇨ Raven black front bezel
⇨ H 1.75" (1U) x W 17.3" x D 22"; 43mm x 440mm x 559mm
⇨ 24.25 to 30 lbs; 11kg to 12.7kg (minimum to max configuration)
⇨ Configuration/Setup Utility: F1 at startup
⇨ Network Boot: F12 at startup
⇨ Operator Information Panel in front
⇨ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
⇨ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure
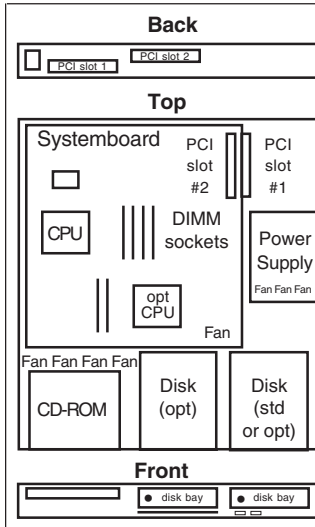
LIMITED WARRANTY[3]

➥ **1 year parts and labor standard 8849 MTM**
➥ **3 year parts and labor standard 8491 MTM**
➥ **International Warranty Service**[3]
➥ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
➥ **On site service upgrade options (in eligible locations):**[7]
  • **3 year IOR 9x5, NBD avg response** (ServicePac part num 69P9505)
  • **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9506)
  • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9507)
  • **3 year IOR 24x7, 2 hr response** (ServicePac part num 69P9508)
➥ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
➥ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

See footnotes for important warranty information

IBM @server™ 325 (8835)

IBM® Type-model	Qty x Processor	Proc. Speed	L2 Cache	Memory	Memory type	Disk	Disk controller	Hot-swap or fixed disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
✂ 8835-21X	1 x Opteron™ 240	1.4Ghz[1]	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Oct 2003
✂ 8835-22X	1 x Opteron 240	1.4Ghz	1MB	1GB	Chipkill	80GB[2] EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Oct 2003
8835-31X	1 x Opteron 242	1.6Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Oct 2003
8835-32X	1 x Opteron 242	1.6Ghz	1MB	1GB	Chipkill	80GB[2] EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Oct 2003
8835-51X	1 x Opteron 246	2.0Ghz	1MB	1GB	Chipkill	None (open)	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Oct 2003
8835-52X	1 x Opteron 246	2.0Ghz	1MB	1GB	Chipkill	80GB[2] EIDE	EIDE	2 fixed	2x3	2 x Gigabit	1 year	Oct 2003
✂ 8835-5DX	2 x Opteron 246	2.0Ghz	1MB	2GB	Chipkill	36.4GB 10K	Ultra320	2 hot-swap	2x3	2 x Gigabit	1 year	Oct 2003

Processor(s)	**Up to 2 x AMD® Opteron™ 246** with 800Mhz HyperTransport technology / 64-bit x86 Instruction set / 32-bit compatible
L2 cache	**1MB** / on die of processor / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, six memory DIMM slots, two 64-bit 100Mhz PCI-X slots, integrated SCSI, ethernet, graphics / AMD Opteron HyperLink bus interface
Memory	**Up to 2GB** std / 12GB max[13] (when 2GB DIMMs become available) / four slots enabled with uni-processor, six with dual / two slots used (four slots used in 5DX model) / four slots available (two avail. in 5DX) / **PC2700** 333MHz registered 184-pin ECC DDR-SDRAM DIMMs / six DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)
SCSI disk controller	*All (not used on EIDE models):* **LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
IDE controller / cable	*All:* Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) *EIDE models:* One 2-drop EIDE cable to two disk bays (primary) / one 1-drop EIDE cable to CD-ROM (secondary)
Disk - capacity	*SCSI models:* 36.4GB supports up to 15000 rpm disks; *EIDE models:* 80GB / 7200 rpm / ATA-100 / 8.7ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled
Mechanical Architecture / chipsets	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products **AMD® 8131 PCI-X Bridge Chip** providing two PCI-X bridges running at 100Mhz (bridge A for SCSI and Ethernet; bridge B for PCI-X expansion slots) / **8111 I/O HyperTransport Bridge Chip** supporting a 200 Mhz double-pumped HyperTransport clock (PCI, AC '97, Ethernet, SMBus, USB, EIDE, LPC to BIOS and Super I/O) / National Semiconductor® PC87366 Super I/O chip
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5704 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM/diskette/kbd	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
Front ports / graphics	*Front:* two USB (Vers 1.1); *Graphics:* SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus A
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported

Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / optional Remote Supervisor Adapter II card not supported
Diagnostics	Diagnositc LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	Eight fans (five for system, three inside power supply) / variable speed / not redundant or hot-swap
Power supply	411 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys

Opteron 240 Processor Upgrade	24P8189
Opteron 242 Processor Upgrade	24P8190
Opteron 246 Processor Upgrade	13N0700
512MB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2266
1GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2267
2GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2269
80GB ATA-100 EIDE HDD*	09N4226
120GB ATA-100 EIDE HDD*	09N4231
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	32P0734
73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	32P0735
IBM TotalStorage FC2-133 Host Bus Adapter	24P0960
IBM ServeRAID-6M SCSI (256MB Cache)	02R0988
USB Portable Diskette Drive	05K9276
NetBAY ACT Local Console Manager (LCM)	1735L04
NetBAY Remote Console Manager (RCM)	1735R16
1.5M USB Conversion Option	73P5832
* Disk not supported in all e325 systems	

Back

PCI slot 1   PCI slot 2

Top

Systemboard   PCI slot #2   PCI slot #1

CPU   DIMM sockets   Power Supply / Fan Fan Fan

opt CPU   Fan

Fan Fan Fan Fan

CD-ROM   Disk (opt)   Disk (std or opt)

Front

● disk bay   ● disk bay

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

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

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

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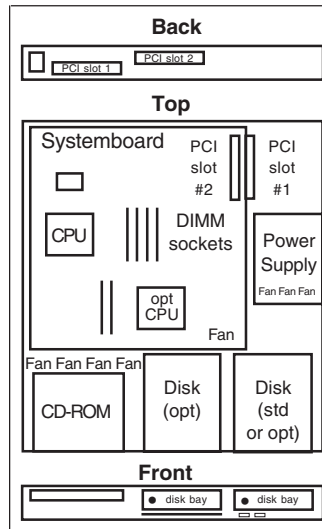240GB with two 120GB EIDE disks

See footnotes for important warranty information

● = 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)

(X325A) © IBM Corp. August 2003

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

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

Processor(s)	**Up to 2 x AMD® Opteron™ 248** with 800Mhz HyperTransport technology / 64-bit x86 Instruction set / 32-bit compatible
L2 cache	**1MB** / on die of processor / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, six memory DIMM slots, two 64-bit 100Mhz PCI-X slots, integrated SCSI, ethernet, graphics / AMD Opteron HyperLink bus interface
Memory	**1GB** std / 12GB max[13] / four slots enabled with uni-processor, six with dual / two slots used / four slots available / **PC2700** 333MHz registered 184-pin ECC DDR-SDRAM DIMMs / six DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2-bit through 8-bit errors contained in two chips)
SCSI disk controller	*All (not used on EIDE models):* **LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
IDE controller / cable	*All:* Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) / *EIDE models:* One 2-drop EIDE cable to two disk bays (primary) / one 1-drop EIDE cable to CD-ROM (secondary)
Disk - capacity	*SCSI models:* 36.4GB supports up to 15000 rpm disks; *EIDE models:* 80GB / 7200 rpm / ATA-100 / 8.7ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**AMD® 8131 PCI-X Bridge Chip** providing two PCI-X bridges running at 100Mhz (bridge A for SCSI and Ethernet; bridge B for PCI-X expansion slots) / **8111 I/O HyperTransport Bridge Chip** supporting a 200 Mhz double-pumped HyperTransport clock (PCI, AC '97, Ethernet, SMBus, USB, EIDE, LPC to BIOS and Super I/O) / National Semiconductor® PC87366 Super I/O chip
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5704 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus B / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM/diskette/kbd	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 1.1), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
Front ports / graphics	*Front:* two USB (Vers 1.1); *Graphics:* SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 Bus A
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported

Systems mgmt	Standard MS-9549 QLogic system management / connector on planar / Remote Supervisor Adapter II card not supported	Opteron 248 Processor Upgrade	13N0701
		Opteron 250 Processor Upgrade	13N0702
		512MB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2266
Diagnostics	Diagnositc LEDs for fans, memory DIMMs and processors only / Light Path Diagnostics not supported	1GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2267
		2GB PC2700 CL2.5 ECC DDR-SDRAM RDIMM	73P2269
		80GB ATA-100 EIDE HDD*	09N4226
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	120GB ATA-100 EIDE HDD*	09N4231
		36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	32P0734
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others	73.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	32P0735
		IBM TotalStorage FC2-133 Host Bus Adapter	24P0960
Cooling fans	Eight fans (five for system, three inside power supply) / variable speed / not redundant or hot-swap	IBM ServeRAID-6M SCSI (256MB Cache)	02R0988
		USB Portable Diskette Drive	05K9276
Power supply	411 watt / universal / auto-sensing / auto-restart support	NetBAY ACT Local Console Manager (LCM)	1735L04
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), operating sys.	NetBAY Remote Console Manager (RCM)	1735R16
		1.5M USB Conversion Option	73P5832
		Disk not supported in all e325 systems	

Back

PCI slot 1   PCI slot 2

Top

Systemboard   PCI slot #2   PCI slot #1
CPU   DIMM sockets   Power Supply / Fan Fan Fan
opt CPU   Fan
Fan Fan Fan Fan
CD-ROM   Disk (opt)   Disk (std or opt)

Front

● disk bay   ● disk bay

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

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

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

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

See footnotes for important warranty information
● = Hot-swap in some models
US models announced January 2004 (61X, 62X), and May 25, 2004 (71X, 72X)

(X325B) © IBM Corp. January 2004

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

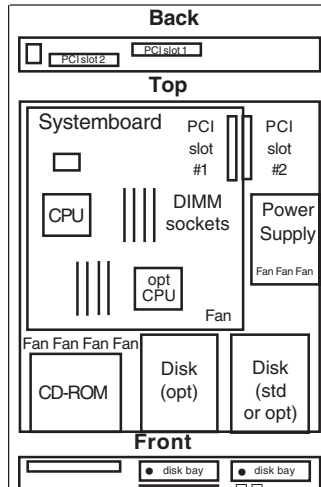|	
Positioning	**Entry 2-way rack server for compute-intesnsive applications and dual core computing at an attractive price**
Processor(s)	**Up to 2 x AMD® Opteron™ 280 Dual Core or 254 Single Core** / 800Mhz HyperTransport technology / Simultaneously supports 32-bit and 64-bit computing
L2 cache	**1MB**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

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

Back

PCI slot 2 | PCI slot 1

Top

Systemboard | PCI slot #1 | PCI slot #2

CPU | DIMM sockets | Power Supply

opt CPU | Fan Fan Fan

Fan

Fan Fan Fan Fan

CD-ROM | Disk (opt) | Disk (std or opt)

Front

disk bay | disk bay

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

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

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

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

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

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

Positioning	**Entry 2-way rack server for compute-intesnsive applications and dual core computing at an attractive price**
Processor(s)	**Up to 2 x AMD® Opteron™ 285 Dual Core or 254 Single Core** / 800Mhz HyperTransport technology / Simultaneously supports 32-bit and 64-bit computing
L2 cache	**1MB** / per core / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	Systemboard contains two AMD Socket 940 micro-PGA ZIF sockets, eight memory DIMM slots, integrated SATA or SCSI, ethernet, graphics, one PCI-E x8 and one 64-bit 133/100Mhz PCI-X (option to convert PCI-X slot to second PCI-E x8)
Memory	**1GB** std / 16GB max[13] / four slots enabled with uni-processor, eight with dual / two slots used / six slots available / **PC3200** registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Chipkill™** supported
SCSI disk controller	*All (not used on SATA models):* **LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
SATA controller/cable	*All:* SATA-150 controller / two connectors on planar / two 1-drop cables / 1 IDE
Disk - capacity	*SCSI models:* some: open some: 36GB; *SATA models:* 80GB / 7200 rpm / 9.0ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / all disk bays Ultra320-enabled, supports 15k drives
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture/chipsets	**ServerWorks HT2000 System I/O controller** connects to the processor sub-system via a 16x Hyper Transport Bus at 1GHz and provides PCI-E, PCI-X and Dual Gigabit Ethernet / **ServerWorks HT1000 South Bridge** interfaces system I/O to the HT2000 via a 8x Hyper Transport bus and provides PCI-X, SATA 2.0, USB 2.0, ATA 100 IDE, SMB, IOAPIC, Event Timer, Watchdog Timer, Interrupt controller and LPCI
Bus slots	(See detail below) one full-length PCI-X 1.0 and one half length PCI-E x8 / option to convert PCI-X slot to PCI-E x8 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5780 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / two rear RJ-45 ports
Optical/diskette/kbd	24X-10X[6] CD-ROM / IDE / *Diskette and keyboard:* none (USB diskette and keyboard optional); legacy not supported
Rear ports	*Rear:* two USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45) / parallel port not supported
Front ports / graphics	*Front:* two USB (Vers 2.0); *Graphics:* SVGA / ATI® RN50b / on planar / 16MB SDRAM std/max / 1024x768x32bit@85Hz
Console interconnects	C2T Interconnect™ cabling not supported / NetBay Local Console Manager (LCM), NetBay Remote Console Manager (RCM), and USB Conversion Option (UCO) are supported

Systems mgmt	Standard MS-9549 QLogic system management / IPMI 1.5 compliant / connector on planar / Remote Supervisor Adapter II optional	Opteron 254 Processor Upgrade	32R2215
		Opteron 265 Processor Upgrade	32R2021
		Opteron 275 Processor Upgrade	32R2023
Diagnostics	Diagnositc LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported	Opteron 285 Processor Upgrade	40K1977
		1GB PC3200 CL3 ECC DDR-SDRAM kit	39M5800
Security	Power-on password / administrator password / Secure Power On/Off / unattended boot / selectable boot / unattended start mode / text console redirect via serial over LAN	2GB PC3200 CL3 ECC DDR-SDRAM kit	39M5803
		80GB SATA-150 7.2k HDD	39M4503
		160GB SATA-150 7.2k HDD	25R6903
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others	73GB 15K Ultra320 SCSI Hot-Swap HDD	90P1319
		146GB 15K Ultra320 SCSI Hot-Swap HDD	40K1028
		146.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1024
Cooling fans	Eight fans (five for system, three inside power supply) / Calibrated Vector Cooling™ / variable speed / not redundant / not hot-swap	300GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1025
		IBM TotalStorage FC2-133 Host Bus Adapter	24P0960
		IBM ServeRAID-6M SCSI (256MB Cache)	02R0988
Power supply	411 watt / universal / auto-sensing / auto-restart support	USB Portable Diskette Drive	05K9276
Prerequisites	Monitor, keyboard, mouse, rack, disk (some), os		

Back

PCI slot 2 | PCI slot 1

Top

Systemboard | PCI slot #1 | PCI slot #2

CPU | DIMM sockets | Power Supply

opt CPU | Fan Fan Fan

Fan

Fan Fan Fan Fan | Disk (opt) | Disk (std or opt)

CD-ROM

Front

disk bay | disk bay

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

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

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

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

See footnotes for important warranty information

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

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

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

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

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

Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**Intel E7520** / Intel Memory Controller Hub (MCH) / 3 PCI buses (one 64bit/133MHz PCI-X1.0, one 64bit/100MHz PCI-X1.0, and 32bit/33MHz PCI) / Intel PCI-X Bridge (supports 133MHz PCI-X slots 1 & 2, LSI Logic 53C1020) / ICH5R South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National PC87427 Super I/O (supports legacy components; keyboard, mouse, serial)
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots / optional full-length PCI-Express x8 Riser Avail
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5721 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two rear RJ-45 ports
DVD-ROM / diskette	*Some*: DVD-ROM / IDE; *Diskette*: none
Rear ports	*Rear*: Two USB (2.0), serial (9-pin), video, two ethernet (RJ-45), one RJ-45 (sys mgmt) / mouse ps2 / keyboard ps2
Graphics	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

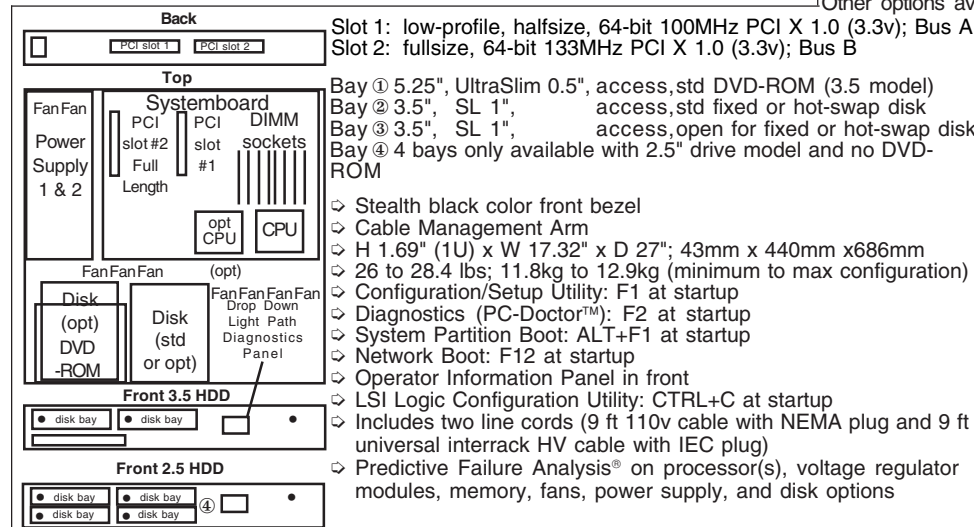|	
Systems mgmt	**IBM Baseboard Management Controller (BMC)** / H8S2168 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter II Slimline with 20-pin conn on planar for continuous pwr (no ext pwr req)
Diagnostics	**Drop down light path diagnostics** Pull out Front panel (LED lights indicate failing component)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others

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

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

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

Back
PCI slot 1   PCI slot 2

Top
Fan Fan / Power Supply 1 & 2 / Systemboard / PCI slot #2 Full Length / PCI slot #1 / DIMM sockets / opt CPU / CPU
Fan Fan Fan (opt) / Disk (opt) DVD -ROM / Disk (std or opt) / Fan Fan Fan Fan Drop Down Light Path Diagnostics Panel

Front 3.5 HDD
disk bay   disk bay

Front 2.5 HDD
disk bay   disk bay
disk bay   disk bay   ④

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

Bay ① 5.25", UltraSlim 0.5", access,std DVD-ROM (3.5 model)
Bay ② 3.5", SL 1", access,std fixed or hot-swap disk
Bay ③ 3.5", SL 1", access,open for fixed or hot-swap disk
Bay ④ 4 bays only available with 2.5" drive model and no DVD-ROM

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

See footnotes for important warranty information

(X336B) © IBM Corp. February 2005

• = Hot-swap in some models

IBM ⒠server™ xSeries™ 336 (8837) - April 2006

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

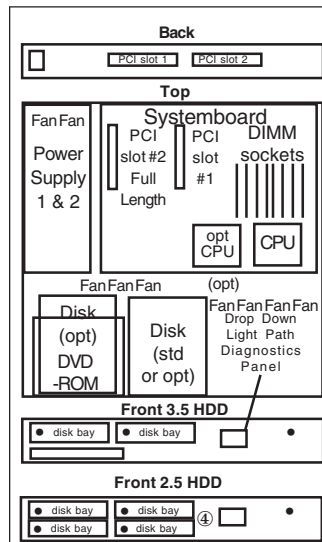|	
Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**Intel® Xeon Processor up to 3.8GHz Single Core 800MHz FSB / Xeon Processor 2.8GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology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

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

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

Back

PCI slot 1   PCI slot 2

Top

Fan Fan | Systemboard
Power Supply 1 & 2 | PCI slot #2 Full Length | PCI slot #1 | DIMM sockets

opt CPU | CPU

Fan Fan Fan (opt)

Disk (opt) DVD -ROM | Disk (std or opt) | Fan Fan Fan Fan Drop Down Light Path Diagnostics Panel

Front 3.5 HDD

● disk bay | ● disk bay | ●

Front 2.5 HDD

● disk bay | ● disk bay
● disk bay | ● disk bay | ④ ☐ | ●

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

Bay ① 5.25", UltraSlim 0.5", access,std DVD-ROM (3.5 model)
Bay ② 3.5", SL 1",   access,std fixed or hot-swap disk
Bay ③ 3.5", SL 1",   access,open for fixed or hot-swap disk
Bay ④ 4 bays only available with 2.5" drive model and no DVD-ROM

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

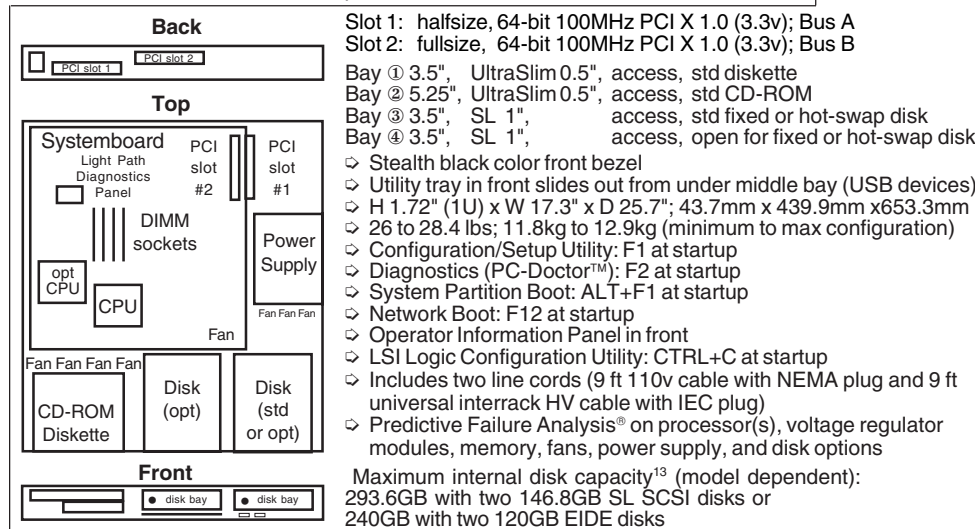See footnotes for important warranty information

● = Hot-swap in some models

(X336C) © IBM Corp. April 2006

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

xREF by eServer Field Skills Enablement Team

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

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

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 2.8BGHz**[1] with 533MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated SCSI, ethernet, graphics
Memory	**512MB** std / 8GB max[13] / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)
SCSI disk controller	*All (not used on EIDE models):* **LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
IDE controller / cable	*All:* Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) *EIDE models:* One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM
Disk - capacity	*SCSI models:* none standard / supports up to 15000 rpm disks; *EIDE models:* 40GB / 7200 rpm / ATA-100 / 8.7ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / **all disk bays Ultra320-enabled**
Mechanical	**EIA 19" Rack (1U**[4]**)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**ServerWorks® Grand Champion™ 4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge for PCI-X Bus A with slot 1 and dual ethernet and PCI-X Bus B with slot 2 and Ultra320 / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2 Bus C with graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National Semiconductor® PC87417 Super I/O chip
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus A / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM / diskette	24X-10X[6] CD-ROM / IDE; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port
Front ports / graphics	*Front:* two USB (Vers 1.1); *Graphics:* SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)
Systems mgmt	**IBM Integrated system management processor** (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter with 20-pin conn on planar for continuous pwr (no ext pwr req)
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	Eight fans (five for system, three on power supply) / variable speed / not redundant or hot-swap
Power supply	**332 watt (-48 to -60 V dc [direct current])** / auto-sensing / supports dual input sources (two power sources) / not redundant / not hot-swap / auto-restart support
Prerequisites	Monitor, keyb., mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5

OPTIONS

Xeon 2.8BGHz/512KB L2 Cache Proc Upg	73P6382
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	06P5776
Remote Supervisor Adapter	09N7585
ServeRAID™-4Mx Ultra160 SCSI Adapter	06P5736
Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)	06P4792
NetBAY ACT Local Console Manager	1735L04

Back

PCI slot 1   PCI slot 2

Top

Systemboard
Light Path Diagnostics Panel
PCI slot #2   PCI slot #1
DIMM sockets
Power Supply
opt CPU
CPU
Fan
Fan Fan Fan
Fan Fan Fan Fan
CD-ROM Diskette   Disk (opt)   Disk (std or opt)

Front

• disk bay   • disk bay

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

Bay ① 3.5", UltraSlim 0.5", access, std diskette
Bay ② 5.25", UltraSlim 0.5", access, std CD-ROM
Bay ③ 3.5", SL 1", access, std fixed or hot-swap disk
Bay ④ 3.5", SL 1", access, open for fixed or hot-swap disk
⇨ Stealth black color front bezel
⇨ Utility tray in front slides out from under middle bay (USB devices)
⇨ H 1.72" (1U) x W 17.3" x D 25.7"; 43.7mm x 439.9mm x653.3mm
⇨ 26 to 28.4 lbs; 11.8kg to 12.9kg (minimum to max configuration)
⇨ Configuration/Setup Utility: F1 at startup
⇨ Diagnostics (PC-Doctor™): F2 at startup
⇨ System Partition Boot: ALT+F1 at startup
⇨ Network Boot: F12 at startup
⇨ Operator Information Panel in front
⇨ LSI Logic Configuration Utility: CTRL+C at startup
⇨ Includes two line cords (9 ft 110v cable with NEMA plug and 9 ft universal interrack HV cable with IEC plug)
⇨ Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

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

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

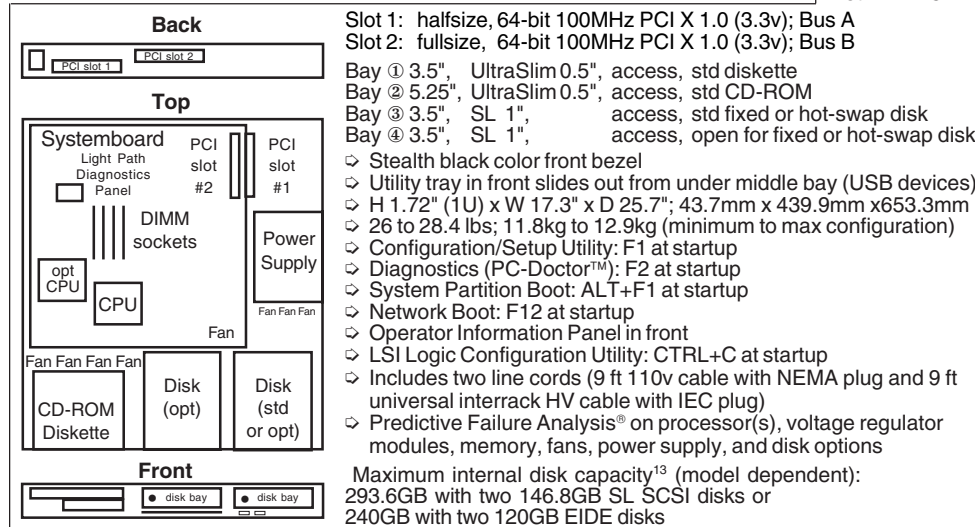(X335DC-A) © IBM Corp. February 2003

• = Hot-swap

☞ US models announced February 18, 2003

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

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

Positioning	*A highly manageable, ultra-dense 1U, 2-way server that delivers performance computing in space-constrained environments*
Processor(s)	**1 x Intel® Xeon 2.8BGHz**[1] with 533MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed (no L3 cache)
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel 603-pin micro-PGA ZIF sockets, four memory DIMM slots, connector for one PCI-X slot, riser for one PCI-X slot, and integrated SCSI, ethernet, graphics
Memory	**512MB** std / 8GB max[13] / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips). Chipkill available on DIMMs of 512MB or greater only.
SCSI disk controller	*All (not used on EIDE models):* **LSI Logic® 53C1020** / **Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X Bus B / supports **RAID-1 mirroring** (Embedded Mirroring) with two SCSI disks in front bays / one 16-bit internal channel / 16-bit 68-pin LVD cable from systemboard to backplane for two disks / no external connector
IDE controller / cable	*All:* Enhanced IDE ATA-100 controller in CSB5 South Bridge / two connectors on planar / one 1-drop IDE cable (CD-ROM) *EIDE models:* One 2-drop EIDE cable to two disk bays / one 1-drop EIDE cable to CD-ROM
Disk - capacity	*SCSI models:* none standard / supports up to 15000 rpm disks; *EIDE models:* 40GB / 7200 rpm / ATA-100 / 8.7ms seek
Disk - bays	*SCSI models:* two hot-swap / 80-pin SCA-2 connectors / filler panels in each disk bay / **all disk bays Ultra320-enabled**
Mechanical	**EIA 19" Rack (1U**[4]**)** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**ServerWorks® Grand Champion**™ **4.0 LE** / CMIC LE Host Bridge (memory controller and I/O Bridge) / one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge for PCI-X Bus A with slot 1 and dual ethernet and PCI-X Bus B with slot 2 and Ultra320 / CSB5 South Bridge (Thin IMB to Host Bridge for PCI 2.2 Bus C with graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / National Semiconductor® PC87417 Super I/O chip
Bus slots	(See below) two available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controllers	Two gigabit 10/100/1000 ethernet ports / Broadcom BCM5703 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz Bus A / full duplex / Wake on LAN® / Alert Standard Format 1.0 / two rear RJ-45 ports
CD-ROM / diskette	24X-10X[6] CD-ROM / IDE; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	*Rear:* one USB (Vers 1.1), C2T in, C2T out, serial (9-pin), two ethernet (RJ-45), one RS-485 (sys mgmt) / no parallel port
Front ports / graphics	*Front:* two USB (Vers 1.1); *Graphics:* SVGA / ATI® Rage XL / on planar / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Console interconnects	C2T Interconnect™ cable (10 inch, 245mm) is standard (Keyboard Video Mouse (KVM) chaining cable) / one Cable Chain Technology Cable Kit required at end of chain (a cable with separate keyboard, mouse, monitor connectors)
Systems mgmt	**IBM Integrated system management processor** (ISMP) / H8S2148 / on planar / provides system and environmental monitoring such as temp, memory, optional disks, fans, power supply / support for optional Remote Supervisor Adapter with 20-pin conn on planar for continuous pwr (no ext pwr req)
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others
Cooling fans	Eight fans (five for system, three on power supply) / variable speed / not redundant or hot-swap
Power supply	**332 watt (-48 to -60 V dc [direct current])** / auto-sensing / supports dual input sources (two power sources) / not redundant / not hot-swap / auto-restart support
Prerequisites	Monitor, keyb, mouse, rack, disk, operating sys, one C2T Kit per chain of servers or NetBAY ACT CAT-5

OPTIONS

Xeon 2.8BGHz/512KB L2 Cache Proc Upg	73P6382
2x256MB PC2100 CL2.5 non-Chipkill DIMM	73P2868
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD	06P5776
Remote Supervisor Adapter	09N7585
ServeRAID™-4Mx Ultra160 SCSI Adapter	06P5736
Cable Chain Technology (C2T) Cable Kit (2 meter breakout cable and 2 meter KVM chaining cable)	06P4792
NetBAY ACT Local Console Manager	1735L04

Back

PCI slot 1   PCI slot 2

Top

Systemboard
Light Path Diagnostics Panel

PCI slot #2   PCI slot #1

DIMM sockets

Power Supply

opt CPU

CPU

Fan

Fan Fan Fan

Fan Fan Fan Fan

CD-ROM Diskette   Disk (opt)   Disk (std or opt)

Front

● disk bay   ● disk bay

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

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

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

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

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

See footnotes for important warranty information
● = Hot-swap
US models announced January 20, 2004

(X335DC-B) © IBM Corp. January 2004

IBM® Type-model	Qty x Processor	L2 cache	Memory	Ultra160 SCSI disk	SCSI controller	Mech-anical	Slots x bays	Fixed disk bays	Alarm Panel	Power supply	Compliant	Available date
8827-14X	2 x Pentium® III 1.26GHz	512KB	2GB	1 x 36.4GB[2] 10K	2 x Ultra160	2U[4] rack	6x4	2 fixed	Yes	DC power	NEBS-3	Apr 2002

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

Positioning	*Network Equipment Building System (NEBS) level 3-compliant for telecommunications carrier-grade environments*
Processor(s)	**2 x Intel® Pentium® III 1.26GHz-S with 133MHz frontside bus**
L2 cache	**512KB** std and max / ECC / at processor speed / processor and L2 cache in Flip Chip Pin Grid Array (FC-PGA2)
Implementation	Motherboard contains two Intel PGA370 sockets, six DIMM sockets, two PCI riser connectors, and integrated subsystems
SMP support	**2-way SMP** via second identical processor is standard
Memory	**2GB std / 6GB[13] max** / 6 sockets / 4 available (ships with two 1GB DIMMs) / **Error Checking and Correcting** (ECC) memory controller / matched pairs required / two-way interleaving / **SDRAM / 133MHz** / six 168-pin gold-plated sockets / PC133-compliant / supports registered SDRAM ECC DIMMs only
SCSI disk controller	**Adaptec® AHA-7899W / dual channel Wide Ultra160 SCSI controller** (LVD 160MB/sec) / on planar / 64-bit PCI
SCSI channels	*SCSI Channel A:* external 16-bit .8mm VHDCI 68-pin external connector (no cables)
	SCSI Channel B: one internal 16-bit 68-pin LVD cable from controller to two-bay disk drive carrier
SCSI disk	**1 x 36GB** Ultra160 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T.[5]
SCSI disk bays	Two fixed disk bays (not hot-swap) in disk drive carrier that slides out from front
IDE controller / cable	EIDE ATA-33 controller in South Bridge / one connector on planar / one 1-drop IDE cable (to CD-ROM)
Mechanical	**EIA 19" Rack (2U[4]) x 20-inch deep**
Rack support	Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit
PCI bus slots	(See below) three full height full length 64-bit 33MHz slots / three low-profile half length 64-bit 66MHz PCI slots / PCI 2.2 / peer PCI buses / no hot-swap Active™ PCI slots
Chipset	**ServerWorks® III HE-SL chipset** / CNB20HE-SL North Bridge for CIOB and PCI A 32-bit 33MHz (graphics, ethernet, South Bridge) / NB6555 Champion I/O Bridge (CIOB20) for PCI Bus B (slots, SCSI) and C (slots) / CSB5 South Bridge for EIDE, USB, LPC bus for Super I/O National Semiconductor PC8741 (diskette, serial, keyboard) and Baseboard Management Controller
Bays	(See diagram below): 4 bays / two disk bays (not hot-swap) / one CD-ROM bay / one diskette bay
10/100 ethernet	2 x Intel 82550 / on planar / full duplex / supports Wake on LAN®, PXE 2.0 Boot Agent, Adapter Fault Tolerance Failover
CD-ROM / diskette	24X-10X[6] CD-ROM / multisession / IDE interface / bootable; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Rear ports	Two USB ports (Version 1.1); RJ-45 serial; PS/2 keyboard; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port / mouse connects to USB port (or keyboard port with standard Y-splitter cable)
Graphics controller	SVGA / PCI bus / ATI® Rage XL (on planar) / 8MB SDRAM std/max / 1600x1280 at 16M colors at 85Hz / 15-pin D-shell
Security	Power-on password / admin password / unattended boot / selectable boot / boot without keyboard / diskette write protect
Alarm panel	**External alarm panel** in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault
Status LEDs	**Operator Information Panel** (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)
Systems mgmt	**Integrated service processor** (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /
Diagnostics	LED diagnostics and on-board diagnostics providing an LED map to a failing component
OS support	**Red Hat Linux® 7.1**
Software ship group	**Resource CD** (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide), PC-Doctor™ diagnostics diskette, and IBM Director (on separate CD)

Keyboard / mouse	None (since rack-based)	512MB SDRAM ECC DIMM 133MHz RDIMM	33L3324
Power supply	*Std:* two; *max:* two / accessible from rear /	1GB SDRAM ECC DIMM 133MHz RDIMM	33L3326
	350 watt (-48 to -60 V dc [direct current]) /	36.4GB 10K Ultra160 SCSI SL HDD	06P5751
	supports dual input sources (two power sources) /	IBM E54 (13.8" viewable) FST Monitor (black)	633147N
	redundant / hot-swap / auto-restart support	IBM Sleek Two-Button Mouse (black)	28L3673
		IBM 84-key Space Saver Keyboard (black)	28L3644
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	Other options at **ibm.com**/pc/us/accessories	
Prerequisites	Appropriate dc power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system		

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

⇨ Raven black color (front bezel)
⇨ Configuration/Setup Utility invoked by pressing F2 at startup
⇨ SCSISelect near startup by pressing CTRL+A
⇨ PC-Doctor™ diagnostics on diskette
⇨ Several hardcopy publications
⇨ H 3.5" x W 17.5" x D 20.0"
⇨ H 89 mm x W 445 mm x D 508 mm
⇨ 34 to 37 pounds (15.4 to 16.8 kg)
⇨ IPMI 1.5 and WfM 2.0-compliant

```
        CD-ROM
        diskette                    2U Rack
  disk bay           disk bay
```

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

LIMITED WARRANTY[3]
☞ **1 year parts and labor**
☞ **International Warranty Service[3]**
☞ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]**
☞ **1 year on site warranty service upgrade options (in eligible locations):[7]**
  • **9 hr coverage, Mon-Fri excluding holidays, 4 hr response time** (No ServicePac® part number)
  • **24 hr x 7 day coverage, 4 hour average response time** (No ServicePac part number)
  • **24 hr x 7 day coverage, 2 hour average response time** (No ServicePac part number)
☞ **24x7[14] toll-free support for warranty issues during the warranty period[3]**

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

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

(X343A) © IBM Corp. March 2002

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

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

Positioning	*Network Equipment Building System (NEBS) level 3-compiant for telecommunications carrier-grade environments*
Processor(s)	**2 x Intel® Pentium® Xeon 2.4GHz with 533MHz frontside bus**
L2 cache	**512KB** std and max / ECC / at processor speed / processor and L2 cache in Flip Chip Pin Grid Array (FC-PGA2)
Implementation	Motherboard contains two Intel Socket 604 INT3/FCPGA, six DIMM sockets, two PCI riser connectors, and integrated
SMP support	subsystems **2-way SMP** via second identical processor is standard
Memory	**Up to 2GB std / 12GB[13] max / 266MHz SDRAM** / Six 168-pin sockets / Two sockets used / Four sockets available / ships with two 512 GB or 1GB DIMMs / **Error Checking and Correcting** (ECC) memory controller / matched pairs required / two-way interleaving / optional 2GB upgrade kit available by special bid
SCSI disk controller	**Adaptec® AIC-7902W / dual channel Wide Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit PCI
SCSI channels	*SCSI Channel A:* external 16-bit .8mm VHDCI 68-pin external connector (no cables)
	SCSI Channel B: one internal 16-bit 68-pin LVD cable from controller to two-bay disk drive carrier
SCSI disk	**1 x 73.4GB or 146.8GB** Ultra320 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T.[5]
SCSI disk bays	Two fixed disk bays (not hot-swap) in disk drive carrier that slides out from front
IDE controller / cable	EIDE ATA-66 controller in South Bridge / one connector on planar / one 1-drop IDE cable (to CD-ROM)
Mechanical	**EIA 19" Rack (2U[4]) x 20-inch deep**
Rack support	Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit
PCI bus slots	(See below) three full height full length 64-bit 133MHz slots / three low-profile half length 64-bit 66MHz PCI slots / PCI 2.2 / peer PCI buses / no hot-swap Active™ PCI slots
Chipset	**Intel® E7501 chipset** / E7501 MCH North Bridge for CIOB and PCI A 64-bit 33MHz (graphics, ethernet, South Bridge) / P64Hz PCI Bus B (slots, SCSI) and C (slots) / ICH3-S South Bridge for EIDE, USB, LPC bus for Super I/O National Semiconductor PC87417 (serial, keyboard) and Baseboard Management Controller
Bays	(See diagram below): 3 bays / two disk bays (hot-swap) / one CD-ROM bay
10/100 ethernet	2 x Intel 82546 / on planar / full duplex / supports Wake on LAN®, PXE 2.0 Boot Agent, Adapter Fault Tolerance Failover
CD-ROM / diskette	24X-10X[6] CD-ROM / multisession / IDE interface / bootable
Rear ports	Two USB ports (Version 1.1); RJ-45 serial; PS/2 keyboard; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port / mouse connects to USB port (or keyboard port with standard Y-splitter cable)
Graphics controller	SVGA / PCI bus / ATI® Rage XL (on planar) / 8MB SDRAM std/max / 1600x1280 at 16M colors at 85Hz / 15-pin D-shell
Security	Power-on password / admin password / unattended boot / selectable boot / boot without keyboard
Alarm panel	**External alarm panel** in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault
Status LEDs	**Operator Information Panel** (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)
Systems mgmt	**Integrated service processor** (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /
Diagnostics	LED diagnostics and on-board diagnostics providing an LED map to a failing component
OS support	Microsoft Windows 2000, Windows 2003 Advanced Server / Red Hat AS 2.1 / SLES
Software ship group	Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide)

Keyboard / mouse	None (since rack-based)	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*
	480 watt (-48 to -60 V dc [direct current]) / supports dual input sources (two power sources) / **redundant / hot-swap** / auto-restart support	
Fans	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each Pentium III processor	
Prerequisites	Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system	

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
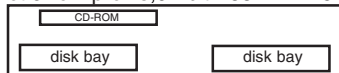
```
 CD-ROM
                              2U Rack
 disk bay        disk bay
```

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

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

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

LIMITED WARRANTY[3]
➥ **3/3 year parts and labor**
➥ **International Warranty Service**[3]
➥ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
➥ **2 year on site warranty service upgrade options (in eligible locations):**[7]
   • **9 hr coverage, Mon-Fri excluding holidays, 4 hr response time 96P2122**
   • **24 hr x 7 day coverage, 4 hour average response time 96P2123**
   • **24 hr x 7 day coverage, 2 hour average response time 96P2124**
➥ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information
US model announced June 15, 2004
✂ Model withdrawn from marketing effective April 2005

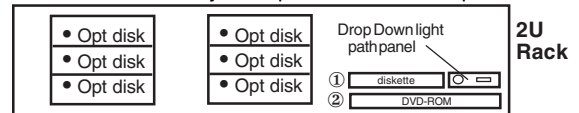(X343B) © IBM Corp. June 2004

IBM® Type-GAV-model	Qty x Processor	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-15y-15U	1 x Xeon™ 3.0GHz	2MB	1GB	None	2 x Ultra320	2U⁴	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-16y-16U	1 x Xeon 3.0GHz	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-25y-25U	1 x Xeon 3.2GHz	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-35y-35U	1 x Xeon 3.4GHz	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-36y-36U	1 x Xeon 3.4GHz	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-45y-45U	1 x Xeon 3.6GHz	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005
8840-E1y-E1U	1 x Xeon 3.0GHz	2MB	1GB	3x73.4GB	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Mar 2005

Positioning	*A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*
Processor	**1 x Intel® Xeon™ Processor 2.8, 3.0, 3.2, 3.4, 3.6Ghz** with **800MHz** frontside bus / **Optimized for Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / **Simultaneous multi-threaded (SMT)**
L2 cache	**2MB** L2 Cache / on die of processor / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel PGA604 micro-PGA ZIF sockets, eight memory DIMM slots, two low-profile PCI-X (100MHz) slots, two full-length PCI-X (133MHz) slots, and integrated SCSI, dual GB ethernet, graphics
Memory	**1GB** std / 16GB¹³ max / two slots used / six slots available / DIMMs / **PC2-3200 DDR2** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Active Memory™:** Memory mirroring, hot-spare memory **/ Error Checking and Correcting (ECC) /** *optional* **16-bit Checksum Chipkill**™ corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips,
SCSI disk controller	**Adaptec® AIC-7902 / dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports **RAID-0 and 1** with up to one hot-spare disk / optional IBM ServeRAID™-7k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SCSI channels	Two 16-bit channels (one internal and one external) / *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 (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Chipset	**Intel E7520** / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Proccesor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O
Bus slots	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controller	Two gigabit 10/100/1000 ethernet ports /**Two Broadcom® 5721** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette	8X-24X⁶ 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 reseerved connector for continuous power (no ext power reqd)	Xeon 2.8GHz 800MHz/2MB L2 Proc Upg	25R8908
		Xeon 3.0GHz 800MHz/2MB L2 Proc Upg	25R8902
		Xeon 3.2GHz 800MHz/2MB L2 Proc Upg	25R8903
		Xeon 3.4GHz 800MHz/2MB L2 Proc Upg	13N0686
		Xeon 3.6GHz 800MHz/2MB L2 Proc Upg	13N0687
		Xeon 3.8GHz 800MHz/2MB L2 Proc Upg	13N0689
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-Chpk Kit	73P3523
		1GB(2x512)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3522
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	2GB(2x1GB)PC2-3200 CL3 ECC DDR2-SDRAM	73P2866
		IBM ServeRAID-7k Adapter	71P8642
Keyboard / mouse	None standard (because rack-based)	IBM Remote Supervisor Adapter II Slim	73P9341
Power supply	*Std/Max:* one/two 625 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	73.4GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1305
		146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD	90P1306
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	625W (N. America) Hot-Swap Power Supply	26K5097
		NetBAY Local Console Manager	1735L04
		NetBAY Remote Console Manager	1735R16
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack	Other options at **ibm.com**/pc/us/accessories	

Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A
Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X non hot, Bus A
Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*
Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*
*slots 3 & 4 riser may be replaced with PCI-Express riser

⇨ 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

Drop Down light path panel

2U Rack

① diskette
② DVD-ROM

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

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

See footnotes for important warranty information   • = Hot-swap   (X346B) © IBM Corp. February 2005

IBM® Type-GAV-model	Qty x Processor/Core	L2 Cache	Memory	Disk	SCSI controller	Form Factor	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
8840-05y-05U	1 x Xeon™ 2.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U⁴	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-E3y-E3U	1 x Xeon 2.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-E4y-E4U	1 x Xeon 3.4GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	2 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-55y-55U	1 x Xeon 3.8GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Sep 2005
8840-D1y-D1U	1 x Xeon 2.8GHz/DC	2x2MB	2GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Oct 2005
8840-1Ry-1RU	1 x Xeon 3.0GHz/SC	2MB	1GB	None	2 x Ultra320	2U	4x8 (6 hot-swap)	1 x 625W hot-swap	2 x Gigabit	Apr 2006

Positioning	*A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*
Processor	**Intel® Xeon™ Processor up to 3.8GHz Single Core 800MHz FSB / Xeon Processor 2.8GHz Dual Core 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)** / Hyper-Threading / **Simultaneous multi-threaded**
L2 cache	**2MB** L2 Cache std on Single Core / **2x2MB** L2 Cache std on Dual Core / on die of processor / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel PGA604 micro-PGA ZIF sockets, eight memory DIMM slots, two low-profile PCI-X (100MHz) slots, two full-length PCI-X (133MHz) slots, and integrated SCSI, dual GB ethernet, graphics
Memory	**1GB or 2GB** std / 16GB¹³ max / two slots used / six slots available / DIMMs / **PC2-3200 DDR2** 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel **Active Memory™:** Memory mirroring, hot-spare memory **/ Error Checking and Correcting (ECC) /** optional **16-bit Checksum Chipkill**™ corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips.
SCSI disk controller	**Adaptec® AIC-7902 / dual channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports **RAID-0 and 1** with up to one hot-spare disk / optional IBM ServeRAID™-7k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
SCSI channels	Two 16-bit channels (one internal and one external) / *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 SCA2 connectors / filler panels installed in each disk bay / all disk bays Ultra320-enabled
Mechanical	**EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Chipset	**Intel E7520** / Memory Controller Hub (MCH) / Intel I/O Controller Hub 5 (ICH5) / Two Intel PCI-X Hubs (133MHz PCI-X slots 3 & 4) / Intel Dodson I/O Proccesor (supports 100MHz PCI-X slots 1 & 2, Adaptec AIC-7902 and optional ServeRAID 7k Adapter / ICH5 South Bridge (Thin IMB to Host Bridge for graphics controller, EIDE, USB, SMBus, LPC bus to Super I/O) / LPC-SIO 8742x Super I/O
Bus slots	(See below) Four available PCI-X 1.0 / no hot-swap Active™ PCI slots
Ethernet controller	Two gigabit 10/100/1000 ethernet ports /**Two Broadcom® 5721** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette	8X-24X⁶ DVD-ROM / IDE; *Diskette:* 3.5" 1.44MB diskette drive / dust cover
Front & Rear ports	*Front:* one USB (Vers 2.0) *Rear:*two USB (Vers 2.0), keyboard, mouse, serial (9-pin), graphics (DB-15), two ethernet (RJ-45), two RJ-45 (sys mgmt) / no parallel port
Graphics	SVGA / ATI® Radeon™ 7000m / on planar / 16MB DDR SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Security	Power-on password / administrator password / unattended boot / selectable boot sequence

Systems mgmt	**IBM Baseboard Management Controller** (BMC) / H8S2168 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports optional Remote Supervisor Adapter II slimline with reseverved connector for continuous power (no ext power reqd)	Xeon 2.8GHz SC 800MHz/2MB L2 Proc Upg	40K2503
		Xeon 2.8GHz DC 800MHz/4MB L2 Proc Upg	40K2502
		Xeon 3.0GHz SC 800MHz/2MB L2 Proc Upg	40K2504
		Xeon 3.2GHz SC 800MHz/2MB L2 Proc Upg	40K2505
		Xeon 3.4GHz SC 800MHz/2MB L2 Proc Upg	40K2506
		Xeon 3.6GHz SC 800MHz/2MB L2 Proc Upg	40K2507
		Xeon 3.8GHz SC 800MHz/2MB L2 Proc Upg	40K2508
Diagnostics	**Drop down light path diagnostics** panel providing LED map to failing part (located on front panel)	512MB(2x256)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	73P3523
		1GB(2x512)PC2-3200 CL3 ECC DDR2 Non-Chpk Kit	39M5818
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	2GB(2x1GB)PC2-3200 CL3 ECC DDR2-SDRAM	39M5809
		4GB(2x2GB)PC2-3200 CL3 ECC DDR2-SDRAM	39M5815
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	40K1023
		146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD	40K1024
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	625W (N. America) Hot-Swap Power Supply	26K5097
		NetBAY Local Console Manager	1735L04
Prerequisites	Monitor, keyboard, mouse, SCSI disk, rack	NetBAY Remote Console Manager	1735R16
		Other options at **ibm.com**/pc/us/accessories	

Slot 1: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A
Slot 2: low-profile, 64-bit 100MHz 3.3v PCI-X, non hot, Bus A
Slot 3: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*
Slot 4: full, 64-bit 133MHz 3.3v PCI-X, not hot-swap, Bus B*
*slots 3 & 4 riser may be replaced with PCI-Express riser

⇨ 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

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

All models: Max int disk capacity: 1.8TB² with six 300GB SL disks

See footnotes for important warranty information   • = Hot-swap   (X346C) © IBM Corp. April 2006

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	3U⁴ rack	6x5	One	One (not redun)	PCI	Jun 2003
✂ 8686-1SQ	2 x Xeon MP 2.0GHz	1MB	1GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Nov 2003
✂ 8686-1TQ	2 x Xeon MP 2.0GHz	1MB	3GB Chipkill 2 x 36.4GB 10K		Ultra160	3U rack	6x5	One	Two redundant	PCI	Nov 2003
8686-2RQ	2 x Xeon MP 2.5GHz	1MB	2GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Jun 2003
8686-3RQ	2 x Xeon MP 2.8GHz	2MB	2GB Chipkill	None	Ultra160	3U rack	6x5	One	Two redundant	PCI	Jun 2003

Processors	**1** or **2 x Intel® Xeon™ Processor MP 2.0, 2.5, or 2.8GHz**[1] with 400MHz frontside bus / Hyper-Threading technology
L2 cache	**512KB** / on die of processor / at processor speed
L3 cache	**1MB** or **2MB** / on die of processor / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size)
Implementation	Systemboard contains four Intel 603-pin micro-PGA ZIF sockets, one memory board slot, six Active™ PCI-X slots, and integrated SCSI, ethernet, graphics
Memory	Up to **3GB** std / 16GB max[12,13] / two (1GB model), four (2GB models) or six (3GB models) 512MB DIMMs installed / 1.7-inch tall / one memory board standard with 8 DIMM gold-connector slots / DIMMs must be installed in matched pairs / 128-bit simultaneous transfer from two DIMMs / PC1600 200MHz registered 184-pin DDR-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)
SCSI disk controller	Adaptec® AIC-7892 / Wide Ultra160 SCSI (LVD 160MB/sec) / single channel / 64-bit 33MHz PCI / integrated on planar
SCSI connectors	Controller hard-wired to SCSI backplane (no cable) / no external SCSI connector
SCSI cabling	One standard 16-bit LVD cable included for attaching an optional ServeRAID adapter to the three-bay backplane; SCSI RAID adapter 68-pin connector on systemboard for this cable to get signals to three-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in OSB4 South Bridge
Disk - capacity	None standard / supports up to 15,000 rpm disks
Disk - bays	Three hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-32™ chipset** / IBM Memory I/O Controller (improved performance from earlier models) with two remote I/O ports (one to IBM PCI-X Host Bridge; one to RXE Expansion Port) / IBM PCI-X Host Bridge provides three peer PCI buses (two PCI-X 1.0, one PCI 2.2) / PCI 2.2 Bus 0 supports SCSI, graphics, ethernet, adapter slot with Remote Supervisor Adapter, and ServerWorks® OSB4 South Bridge (IDE, USB, ISA bus for Super I/O NS PC97317VUL [diskette, keyboard, mouse])
Slots (Active™ PCI-X)	Six hot-swap PCI-X 1.0 slots[10] available with power and attention indicator lights (optical sensors control power to slot) / **hot replace, hot upgrade, hot expansion** / separated by insulative plastic dividers
RXE Expansion Port	**One port to support up to 12 additional PCI-X slots via an optional IBM RXE-100 Remote Expansion Enclosure**
CD-ROM / diskette	24X-10X⁶ CD-ROM / 3.5" 1.44MB diskette drive
Ethernet	Intel 82559 10/100 ethernet controller / on systemboard / full duplex / 32-bit PCI / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / S3® Savage4 LT / on systemboard / 8MB SDRAM std/max / up to 1280x1024 at 64K colors at 85Hz
Ports	*Rear:* RXE-100 Expansion Port (to connect optional RXE-100), RXE Management Port (to manage optional RXE-100), two USB (Ver 1.1), keyboard, mouse, analog DB-15 graphics, ethernet / no serial or parallel ports / *Front:* one USB (Ver 1.1)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**Remote Supervisor Adapter** / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Light Path Diagnostics**™ / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director, and others
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* one or two 370 watt hot-swap; *Max:* three hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / fans in each power supply / PFA
Cooling fans	Six hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

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

Six available 3.3 volt Active PCI-X slots:
- Bus 2 (B) with two slots supports (slots 1, 2):
  - one fullsize, 64-bit, 133MHz PCI-X, hot-swap
  - or two fullsize, 64-bit, 100MHz PCI-X, hot-swap
  - or two fullsize, 64-bit, 66MHz PCI-X, hot-swap
  - or two fullsize, 64-bit, 66MHz PCI, hot-swap
  - or two fullsize, 64-bit, 33MHz PCI, hot-swap
- Bus 1 (A) with four slots supports (slots 3, 4, 5, 6):
  - four fullsize, 64-bit, 66MHz PCI-X, hot-swap
  - or two fullsize, 64-bit, 66MHz PCI, hot-swap
  - or four fullsize, 64-bit, 33MHz PCI, hot-swap
- Bus 0 with one slot supports:
  - only for standard Remote Supervisor Adapter
    halfsize, 64-bit, 33MHz PCI, not hot-swap

Std Power Supply	Std or opt Power Supply	Opt Power Supply	diskette / CD-ROM / • Disk ③ / • Disk ④ / • Opt disk

3U Rack

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

- Dimensions: H5.25" x W17.4" x D27.6"
  Dimensions: H133.4mm x W442.0mm x D701mm
- Weight: 58.4 to 70lbs; 24.9 to 31.8kg
- Stealth black color
- Tool-free serviceability
- Access adapters, processors, memory, and systemboard from top
- Access power supplies and disks from front
- Setup Program by pressing F1 at startup
- Diagnostics (PC-Doctor) by pressing F2 at startup
- SCSISelect by pressing Ctrl+A at startup
- Top cover Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
- Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
- Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

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

LIMITED WARRANTY[3]

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

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

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	3U⁴ rack	6x7	1 x 1300	3	Apr 2005
8863-2RY	1 x Xeon MP 3.66GHz	1MB	2x1GB	4	None	SAS	3U rack	6x7	1 x 1300	3	Apr 2005
8863-3RY	1 x Xeon MP 7020 2.67GHz	2x1MB	2x1GB	4	None	SAS	3U rack	6x7	1 x 1300	3	Nov 2005
8863-4RY	1 x Xeon MP 7040 3.0GHz	2x2MB	2x1GB	4	None	SAS	3U rack	6x7	1 x 1300	3	Nov 2005
8863-E1Y	2 x Xeon MP 3.66GHz	1MB	4x1GB	8	3x36.4-10k	SAS w/ 8i	3U rack	6x7	2 x 1300	3	Jun 2005
8863-E5Y	2 x Xeon MP 3.66GHz	1MB	2x1GB	4	None	SAS	3U rack	6x7	2 x 1300	3	Aug 2005
8863-E6Y	2 x Xeon MP 3.16GHz	1MB	2x1GB	4	None	SAS	3U rack	6x7	2 x 1300	3	Sep 2005
8863-E7Y	4 x Xeon MP 3.66GHz	1MB	8x1GB	16	None	SAS w/ 8i	3U rack	6x7	2 x 1300	3	Sep 2005

Processors	**Up to two 64-bit Intel® Xeon™ Processor MP up to 3.66GHz**[1] **667MHz FSB Single Core / one 64-bit Intel Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading
L2 cache	**1 or 2 MB** / per core / at processor speed / XceL4v™ Dynamic Server Cache
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size) / Dual Core Capable
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, and integrated SCSI, ethernet, graphics
Active Memory™	Up to **4GB** std / 64GB max using high-capacity memory card / one memory board standard with 4 DIMM gold-connector slots / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ / With 16 DIMMs installed: **Memory ProteXion**™ (redundant bit steering) and **Memory Mirroring**™ and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™
SCSI disk controller	*ALL*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 *E1X*: ServeRaid 8i
SCSI connectors	Controller wired to SAS backplane
SCSI cabling	One standard SAS cable attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	*E1x*: 3 x 36.4GB-10k / supports up to 73GB 10K rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U**⁴**)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette	8X⁸ Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / *Front:* USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**Remote Supervisor Adapter II** Slimline (option) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director

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

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

Six available 3.3 volt PCI-X 2.0 slots:

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

| •Opt disk | •Opt disk | •Opt disk | ⬛ DVD-ROM |
| •Opt disk | •Opt disk | •Opt disk | |

Light Path Diag

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: 1,086 Btu/hr (318 watts)
Full Configuration: 5,200 Btu/hr (1524 watts)

➪ Dimensions: H5.25" x W17.4" x D27.6"
  Dimensions: H133.4mm x W442.0mm x D701mm
➪ Weight: 63 to 83lbs; 28.6 to 37.6kg
➪ Stealth black color
➪ Tool-free serviceability
➪ Access adapters, power supplies, processors, memory and systemboard from top
➪ Setup Program by pressing F1 at startup
➪ Diagnostics (PC-Doctor) by pressing F2 at startup
➪ SCSISelect by pressing Ctrl+A at startup
➪ Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
➪ Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
➪ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director
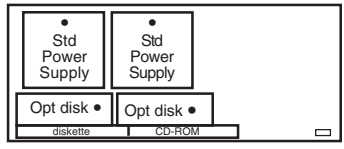
All models: Maximum internal disk capacity: 440.4GB with six 73.4GB² hot-swap SAS disks

LIMITED WARRANTY[3]

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

See footnotes for important warranty information   • = Hot-swap

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

IBM® Type-model	Qty x Processor	L3 cache	L4 cache	Memory	Disk	SCSI controller	Mech-anical	Slots x bays	SMP/RXE Exp Ports	Hot-swap pwr supplies	Mgmt adapter	Available date
8870-1BX	2 x Xeon™ MP 2.2GHz	2MB	64MB	0GB Chipkill™	None	2xUltra320	4U⁴ rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-2BX	2 x Xeon MP 2.7GHz	2MB	64MB	0GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004
8870-4BX	2 x Xeon MP 3.0GHz	4MB	64MB	0GB Chipkill	None	2xUltra320	4U rack	6x4	3/1	Two redundant	PCI	Mar 2004

Positioning	*Up to 8-way (16-way two chassis) power for high-end databases, server consolidation and mission-critical business applications*
Processors	**2 x Intel® Xeon™ Processor MP 2.2, 2.7, or 3.0GHz**[1] with 400MHz frontside bus / supports Hyper-Threading
L3 cache	**2MB or 4MB** each processor / on die of processor / at processor speed
L4 cache	**64MB XceL4™ Server Accelerator Cache** (up to **128MB** with optional SMP Expansion Module) / 64MB in each SMP Expansion Module / ECC / 64-bit 400MHz bus from Cache and Scalability Controller
Processor upgrade	SMP Expansion Module standard / ready for adding additional processors (up to 8 total) and memory
SMP Expansion Module	**One SMP Expanion Module std** / two max / each contains four Intel 603-pin micro-PGA ZIF sockets for Xeon MP, 64MB L4 cache, sixteen DIMM sockets, three SMP Expansion Ports (second module connected via one or two SMP Expansion Ports) / each SMP Expansion Module activates one RXE Expansion Port (one RXE Expansion Port supported)
Additional boards	One I/O Board (PCI-X Host Bridge, SCSI, ethernet, graphics, South Bridge, Super I/O, slot for Mgmt Adapter), one PCI Board (PCI-X Host Bridge, six PCI-X slots), one Midplane Board (connects SMP Exp Modules, I/O Board, PCI Board)
Memory	**0GB** std / **64GB** max[13] (uses standard SMP Expansion Module) / no DIMMs installed / 32 DIMM gold-connector slots / must install two indentical DIMMs at same time / 2-way interleaving / PC2100 DDR SDRAM / **Error Checking and Correcting (ECC)** and **Chipkill**™ via **Memory ProteXion**™ (1, 2, 3, or 4-bit errors on same chip; up to two chips at once; redundant bit steering) / **Active Memory**™ supporting **hot-swap** and **hot-add** (OS specific) and **Memory Mirroring**™ (non-OS specific)
SCSI disk controller	LSI Logic / Wide Ultra320 SCSI (LVD 32MB/sec) / dual channel / 64-bit 66MHz PCI / **integrated RAID-1** on I/O Board
SCSI implementation	First channel to internal 2-port SCSI backplane for internal hot-swap disks (16-bit LVD cable to SCSI backplane) / second channel to one external .8mm VHDCI 68-pin connector (16-bit LVD cable from I/O Board to ext connector) / one standard (longer) 16-bit LVD cable included for attaching an optional ServeRAID adapter to the two-bay backplane
IDE controller	Enhanced IDE ATA-100 controller in South Bridge / one one-drop IDE cable to backplane for diskette and CD-ROM
Disk - capacity/bays	No disks standard / supports up to 15K rpm SCSI disks / two hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (4U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-32™ 2nd Generation chipset** / IBM Cache and Scalability Controller with L4 cache controller and three SMP Expansion Ports / IBM Memory I/O Controller with two remote I/O ports (each to a IBM PCI-X Host Bridge) / each IBM PCI-X Host Bridge provides three peer PCI buses / PCI 2.2 Bus E supports graphics, adapter slot with Remote Supervisor Adapter, VIA® 82C686B South Bridge (IDE ATA-100, USB, Super I/O PC97317VUL [keyboard, mouse]) / PCI 2.2 Bus F supports SCSI, ethernet / PCI-X Bus A, B, C, D support PCI-X slots / designed to the PCI-X 1.0 specification
Slots (Active™ PCI-X)	Six hot-swap PCI-X 1.0 slots[10] available with power and attention indicator lights (optical sensors control power to slot) / **hot replace, hot upgrade, hot expansion** / separated by insulative plastic dividers
RXE Expansion Port	One RXE-100 Remote Expansion Enclosure can be shared between two x445 4-way, 8-way, or 16-way xSeries 445 servers or attached alone. Both PCI-X 6-packs must be installed to support **RIO sharing** as each server will access six additional PCI-X slots.
CD-ROM / diskette	24X-8X⁶ **DVD-ROM** / 3.5" 1.44MB diskette drive / both removable from Ultrabay 2000 bays / supports CD-RW, DVD
Ethernet	**Dual** Broadcomᵃ 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

IBM Preload Kit for 1-8 Processors	48166BU
Microsoft Windows Server Datacenter 2003	
IBM Software Subscription Update for	4816DBX
Microsoft Windows Server Datacenter 2003	
1GB DDR PC2100 ECC SDRAM RDIMM	33L5039
2GB DDR PC2100 ECC SDRAM RDIMM	33L5040
Xeon MP 2.2GHz/2MB L3 Cache Proc Upg	13N0723
Xeon MP 2.7GHz/2MB L3 Cache Proc Upg	13N0722
Xeon MP 3.0GHz/4MB L3 Cache Proc Upg	13N0721
IBM 73.4GB 10K Ultra160 SCSI Hot-Swap	06P5756
IBM ServeRAID™-4H Ultra160 SCSI Adapter	37L6889
Other options at **ibm.com**/pc/us/accessories	

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

```
 ┌──────────┬──────────┐
 │    •     │    •     │
 │  Std     │  Std     │
 │ Power    │ Power    │
 │ Supply   │ Supply   │
 ├──────────┼──────────┤       4U Rack
 │ Opt disk •│ Opt disk •│
 └──────────┴──────────┘
   diskette    CD-ROM
```

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

➪ Dimensions: H7.0" x W19.0" x D27.5"
   Dimensions: H178mm x W483mm x D699mm
➪ Max weight: 110 lbs; 50kg
➪ Stealth black color
➪ Tool-free serviceability
➪ Access processors, memory, adapters, and SMP Expansion Module from top
➪ Access power supplies and disks from front
➪ Setup Program by pressing F1 at startup
➪ Diagnostics (PC-Doctor) by pressing F2 at startup
➪ SCSISelect by pressing Ctrl+A at startup
➪ Information LED panel and front-accessible pull-out Light Path panel (1st and 2nd level diagnostics without removing cover)
➪ Predictive Failure Analysis® alerts on processors, XceL4 Server Accelerator Cache, memory, fans, power supplies, and optional disks with IBM Director

All models: Maximum internal disk capacity: 293.6GB with two 146.8GB² hot-swap SCSI disks

LIMITED WARRANTY[3]

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

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

IBM® Type-model	Qty x Processor	L2 cache	L3 cache	Memory	DIMM slots	Disks	SCSI controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8872-1RY	2 x Xeon™MP 2.83GHz	1MB	4MB	2x1GB	8	None	SAS	3U⁴ rack	6x7	2 x 1300	3	Jun 2005
8872-2RY	2 x Xeon MP 3.0GHz	1MB	8MB	2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Jun 2005
8872-3RY	2 x Xeon MP 3.33GHz	1MB	8MB	2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Jun 2005
8872-5RY	2 x Xeon MP 7020 2.66GHz	2MB		2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2005
8872-6RY	2 x Xeon MP 7040 3.0GHz	2x2MB		2x1GB	8	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2005

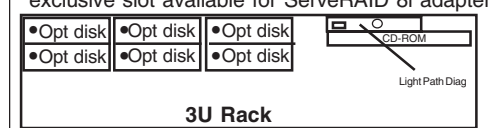|	
Processors	**Two 64-bit Intel® Xeon™ Processor MP up to 3.33GHz**¹ **667MHz FSB Single Core** / **Two 64-bit Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core** / **NetBurst**™ / **Extended Memory 64 Technology**™ **(EM64T)** / Hyper-Threading technology
L2 cache	**1 or 2MB** / per core / **XceL4v**™ Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache	**4 or 8MB** / integrated / at processor speed
Processor upgrade	**4-way SMP** / up to four Xeon Processors (same speed/cache/core) per chassis / Dual Core Capable / up to **32-way** (eight chassis interconnected)
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, one memory board slot, six Active™ PCI-X 2.0 slots, and integrated Serial Attached SCSI, ethernet, graphics
Active Memory™	**2GB** std / 64GB max per chassis using high-capacity memory card / 512GB max (eight chassis interconnect) / two memory cards standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ / **Memory ProteXion**™ (redundant bit steering) and **Memory Mirroring**™ and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™
SCSI disk controller	*ALL*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / ServeRaid 8i optional with dedicated slot
SCSI connectors	Controller wired to SAS backplane
SCSI cabling	One standard SAS cable attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	*None* / supports up to 73GB 10,000 rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER) / connect eight chassis (x460 or MXE-460) to achieve 32-way in 24U
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / Support for external scalability and memory control / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots supported up to 266MHz
CD-ROM / diskette	8X⁶ Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet per chassis / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000M / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* Three Scalability ports, RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial, RS-485 / *Front:* One USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**Remote Supervisor Adapter II slimline** / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director)
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* Two 1300 watt hot-swap; *Max:* two hot-swap / fully redundant with two power supplies /worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

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

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

8W = 2 x XpandOnDemand Scalabilty kits 2.3m

16W = 6 x XpandOnDemand Scalabilty kits 2.3m

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

Six available 3.3 volt PCI-X 2.0 slots:

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

3U Rack

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

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

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

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

LIMITED WARRANTY³
⇨ **3 year parts and labor**
⇨ **International Warranty Service**³
⇨ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**⁷
⇨ **On site service upgrade options (in eligible locations):**⁷
• **3 year IOR 24x7, 4 hr avg response** 96P2688
• **3 year IOR 24x7, 2 hr avg response** 96P2689
• **4 year IOR 9x5, NBD response** 96P2690
• **5 year IOR 9x5, NBD response** 96P2694
⇨ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
⇨ **24x7**¹⁴ **toll-free support for warranty issues during the warranty period**³

See footnotes for important warranty information   • = Hot-swap

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

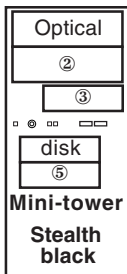|	
Positioning Processor(s)	*Uniprocessor, entry server designed to meet small business needs and budgets* Single-socket AMD® Opteron 1000 Series Dual-Core processor up to 2.4GHz or one Athlon up to 2.2GHz Single-Core
L2 cache Implementation	**2MB** std on Opteron / **512KB** std on Athlon / ECC / full speed Motherboard contains one AM2 socket, four DIMM sockets, four slots(2 PCI Express x8, 2 PCI), integrated SATA and Gigabit Ethernet.
SMP support	No SMP support / no processor upgrade
Memory	**512MB or 1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / **PC2-5300 667MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / dual-channel / industry std / unbuffered
SCSI disk controller IDE disk controller SATA disk controller Cables Disk RAID Controller	None standard / Ultra320 SCSI controller 2 (LVD 320MB/sec) optional for tape backup Enhanced IDE / ATA-100 / integrated in I/O Controller Hub / one connector on planar Dual channel SATA controller (1.5GB/sec) / integrated into I/O Contoller Hub / supports up to two HDDs & one GoVault™ drive standard One 2-drop EIDE cable (to optical drive) / one 1-drop SATA cable per installed hard disk 80 or 160GB SATA / 7,200 rpm / 9.0 ms seek / S.M.A.R.T. None standard / IBM SAS HBA Controller optional for RAID 0 & 1
Rack support Bus slots (see below)	None Two PCI-E x8 slots / two 32-bit 33MHz 5v PCI 2.2 slots
Chipset	**Nvidia® nForce™ Professional 2200 MCP** / I/O Controller Hub provides: two PCI-Express x8 slots, two PCI 2.2 slots, ATA-100 EIDE, SATA, USB, Low Pin Count Interface / SST 49LF004A, 4Mbit Firmware Hub / Winbond® PC8374K Super I/O for diskette, parallel, serial
Ethernet Optical / diskette Ports Diagnostics Systems mgmt	10/100/1000 gigabit / Broadcom 5721 / on planar / full duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN® *Some: CD-ROM:* 48X-20X[6] CD-ROM, IDE; some: CDRW/DVD-ROM Combo: 48X/32X/48X/16X[6], IDE *Front:* two USB(2.0); *Back:* one serial(9-pin), one parallel, four USB(2.0), ethernet(RJ-45), video(DB-15) Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD None
Graphics controller	ATI® ES1000 / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024 x 768 x 32 bit @85Hz
Security	Optional U-Bolt support via knockout / power-on password / boot sequence control / operation without keyboard/mouse/display

Software	**ServerGuide™** (CD-based automated network OS installation and configuration tool) included and IBM Director (system hardware mgmt software) standard
Keyboard / mouse Cooling fans Power supply	Included / USB only Three variable speed fans (cpu heatsink, front, power supply) / not redundant / not hot-swap 310 watts / universal / manual switching / Automatic Server Restart (ASR) / not hot-swap /no redundancy / cooling fan in power supply (variable speed)

512MB PC2-5300 CL5 ECC DDR2	41Y2726
2x1GB PC2-5300 CL5 ECC DDR2	41Y2729
2x2GB PC2-5300 CL5 ECC DDR2	41Y2732
IBM 80GB SATA-150 (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA-150 (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA-150 (7.2K) simple-swap HDD	39M4508
IBM 500GB SATA-150 (7.2K) simple-swap HDD	39M4514
48X/32X/48X/16X Max[6] CD-RW/DVD (black)	32R2905
IBM Multi-burner Plus	32R2906
IBM USB Portable Diskette Drive	40K1692
IBM GoVault 80GB (SATA)	25R0006
IBM 400/800GB LT03 Tape Drive (SCSI)	39M5657
IBM 160/320GB VXA-3 Tape Drive (SCSI)	25R0045
IBM DDS/5 Tape Drive (SCSI)	39M5656
IBM HH LTO2 Tape Drive (SCSI)	39M5658
IBM DLTV4 Tape Drive (SATA)	39M5659
IBM SAS HBA Controller (for SATA RAID 0, 1)	25R8060
IBM Ultra320 SCSI Controller 2	39R8743

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

```
 ┌──────────────┐
 │   Optical    │
 ├──────────────┤
 │      ②       │
 │   ┌────────┐ │
 │   │   ③    │ │
 │   └────────┘ │
 │ ▫ ◎ ▫    ▫   │
 │   ┌────────┐ │
 │   │  disk  │ │
 │   │   ⑤    │ │
```
Mini-tower

Stealth black

Bay ① 5.25", HH   1.6", access, optical
Bay ② 5.25", HH   1.6", access, open (optical or tape)
Bay ③ 3.5", SL 1", access, open
Bay ④ 3.5", SL 1", access, std disk
Bay ⑤ 3.5", SL 1", access, open

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

✧ Removable left side panel
✧ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
✧ Advanced Configuration Power Interface (ACPI) 1.0
✧ Device Drivers and Diagnostics CD-ROM included
✧ Four stabilizing feet

✧ H 17.2" x W 8.1" x D 19.6"
✧ H 438mm x W 205mm x D 497mm
✧ 31 to 38 pounds (14 to 17kg)
✧ BTU Output:
   Minimum: 185 Btu/hr (54 watts)
   Maximum: 853 Btu/hr (250 watts)

✧ Maximum internal disk capacity[13]:
   1TB with two 500GB SATA disks

LIMITED WARRANTY[3]

⮌ **1 year parts and labor**
⮌ **International Warranty Service**[3]
⮌ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
⮌ **On site service upgrade options (in eligible locations):**[7]
  • **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 41W9318)
  • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 41W9317)
  • **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41W9316)
  • **3 year IOR 9x5, NBD response** (ServicePac part num 41W9315)
⮌ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
⮌ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

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

Positioning	*Single socket, entry server for small and medium size business' and distributed enterprises*
Processor(s)	**Intel® Pentium D up to 3.4GHz 800MHz FSB / Xeon up to 2.4GHz 1066 MHz FSB / All Dual-Core / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**1MB** per core std on Pentium D / **2 or 4MB** std on Xeon
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, two PCI Express slots, three PCI slots, SAS/SATA support, ATI video and Gigabit Ethernet.
SMP support	No SMP support / no processor upgrade

Memory	**512MB or 1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-5300 667MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

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

Rack support	5U[4] rack mount support via tower-to-rack kit option
Bus slots (see below)	One PCI-E x8 / one PCI-E x1 / three 32-bit 33MHz 5v PCI 2.2 slots

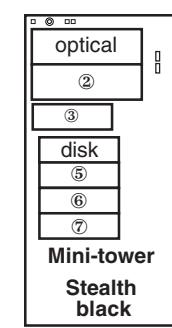|	
Chipset	**Intel 3010 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI 2.2, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5017 Super I/O for diskette, parallel, serial, keyboard, mouse

Ethernet	10/100/1000 gigabit / Broadcom® 5721 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN®
Optical / diskette	*4362 MTMs:* 48X-20X[6] CD-ROM, IDE; *4363 MTMs:* 48X-32X-48X-16X[6] CD-RW/DVD-ROM, IDE / None standard
Ports	*Front:* two USB (2.0); *Rear:* two serial (9-pin), parallel, four USB (2.0), keyboard, mouse, ethernet (RJ45) and video
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan speed and failure, and voltages / **secure remote power on/off** / **support for optional Remote Supervisor Adapter II**

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

Security	Chassiss intrusion detection / mechanical side panel key lock / U-Bolt Tie-down capability/power-on password / boot sequence control / operation without kybd/mouse	512MB PC2-5300 ECC DDR2 667MHz — 41Y2726
		2GB(2x1GB) PC2-5300 ECC DDR2 667MHz — 41Y2729
		4GB(2x2GB) PC2-5300 ECC DDR2 667MHz — 41Y2732
		IBM 80GB SATA (7.2K) simple-swap HDD — 39M4500
Software	**ServerGuide**™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware management software) and many utilities	IBM 160GB SATA (7.2K) simple-swap HDD — 39M4504
		IBM 250GB SATA (7.2K) simple-swap HDD — 39M4508
		IBM 500GB SATA (7.2K) simple-swap HDD — 39M4514
		80GB Hot-Swap SATA HDD — 39M4518
Keyboard / mouse	Optional	160GB Hot-Swap SATA HDD — 39M4522
Cooling fans	Three fans (fansink, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap	250GB Hot-Swap SATA HDD — 39M4526
		500GB Hot-Swap SATA HDD — 39M4530
		73GB 10K 3.5" SAS Hot-Swap HDD — 40K1039
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)	146GB 10K 3.5" SAS Hot-Swap HDD — 40K1040
		300GB 10K 3.5" SAS Hot-Swap HDD — 40K1041
		36GB 15K 3.5" SAS Hot-Swap HDD — 40K1042
		73GB 15K 3.5" SAS Hot-Swap HDD — 40K1043
		146GB 15K 3.5" SAS Hot-Swap HDD — 40K1044
		IBM Multiburner Plus (DVD-RAM) — 32R2906
		IBM Remote Supervisor Adapter II slimline — 39Y9566
		IBM 5Ux20D Tower-to-Rack Kit — 42C8923
		Simple Swap SATA RAID Kit — 42C1312
		Other options at **ibm.com**/pc/us/accessories

Mini-tower

Stealth black

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

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

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

✧ Removable left side panel
✧ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
✧ Advanced Configuration Power Interface (ACPI) 1.0
✧ Device Drivers and Diagnostics CD-ROM included
✧ Four stabilizing feet
✧ H 17.25" x W 8.5" x D 21.25"
✧ H 448mm x W 215.9mm x D 539.75mm
✧ 36 to 56 pounds (16.3 to 25.2kg)

Maximum SATA capacity:
2TB[13] (4 disks x 500GB)
Maximum hot-swap SAS capacity:
1.2TB[13] (4 disks x 300GB)

LIMITED WARRANTY[3]
⮌ **1 year parts and labor standard 4362 MTM**
⮌ **3 year parts and labor standard 4363 MTM**
⮌ **International Warranty Service**[3]
⮌ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
⮌ On site service upgrade options (in eligible locations):[7]
   • **3 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9512)
   • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9511)
   • **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9510)
   • **3 year IOR 9x5, NBD response** (ServicePac part num 69P9509)
⮌ **Other ServicePac options at** http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf
⮌ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

IBM System x3250

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

Positioning	*Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure*
Processor(s)	**Intel® Celeron at 2.93GHz 533 FSB / Pentium D at 3.4GHz Dual-Core 800MHz FSB / Xeon up to 2.4GHz Dual-Core 1066MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)**
L2 cache	**256KB** std on Celeron / **2x2MB** std on Pentium D / **2 or 4MB** on Xeon / ECC / full speed
SMP support	No SMP support
Implementation	Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and two PCI Express® x8 slots

Memory	**512MB or 1GB** std / 8GB[13] max / four 184-pin gold-plated DIMM sockets / two sockets used / **PC2-5300 667MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

SAS/SATA controller	**LSI Logic® 1064e** / daughter card / supports SAS or SATA drives / four-port / PCI-Express / **RAID 0,1**
SATA controller	Four channel SATA controller (3.0GB/sec) / supports 2 drives standard / integrated into South Bridge
IDE controller	Enhanced IDE busmaster / ATA-100 support / one connector on systemboard
Cables	*SAS models:* one 1-drop EIDE cable (connected to Optical)
	SATA models: two 1-drop SATA cables, one 1-drop EIDE cable (connected to Optical)
Disk	None standard

Mechanical Architecture / chipsets	**EIA 22" Rack (1U[4])** / rack-mount only
	Intel 3010 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH7R) for PCI-E, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5017 Super I/O for serial, keyboard, mouse
Bus slots	(See below) two PCI-E™ x8

Ethernet controllers	**Dual-Gigabit** 10/100/1000 ethernet ports / Broadcom® 5721 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is CSA, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)
Optical / diskette	*4364 MTMs:* 48X-20X[6] CD-ROM, IDE; *4365 MTMs:* 48X-32X-48X-16X[6] CD-RW/DVD-ROM, IDE / *Diskette:* none
Ports	*Front:* two USB (2.0) / *Rear:* serial (9-pin), two ethernet (RJ-45), keyboard, mouse, video (DB-15), two USB (2.0), one systems management (RJ-45)
Graphics	ATI® ES1000(RN50) / 16MB SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

Console interconnects	No system-to-system interconnect cable (separate keyboard, video, mouse ports on back)
Systems mgmt	Mini-baseboard management controller / IPMI 1.5 / monitors system and processor temperature, fan failure, and voltages
Diagnostics	Diagnostic LEDS/ Error LEDS for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional slimline Remote Supervisor Adapter II with dedicated slot on planar for continuous power (no external power required)

Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / **secure remote power on / off via IPMI 1.5**
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	351 watt / universal / auto-sensing / auto-restart support
Prerequisites	Monitor, keyboard, mouse, rack

Option	Part
512MB PC2-5300 ECC DDR2	41Y2726
2GB(2x1GB) PC2-5300 ECC DDR2	41Y2729
4GB(2x2GB) PC2-5300 ECC DDR2	41Y2732
IBM 36GB SFF SAS HDD	40K1051
IBM 73GB SFF SAS HDD	40K1052
IBM 80GB SATA (7.2K) simple-swap HDD	39M4500
IBM 160GB SATA (7.2K) simple-swap HDD	39M4504
IBM 250GB SATA (7.2K) simple-swap HDD	39M4508
IBM 500GB SATA (7.2K) simple-swap HDD	39M4514
80GB Hot-Swap SATA HDD	39M4518
160GB Hot-Swap SATA HDD	39M4522
250GB Hot-Swap SATA HDD	39M4526
500GB Hot-Swap SATA HDD	39M4530
73GB 10K 3.5" SAS Hot-Swap HDD	40K1039
146GB 10K 3.5" SAS Hot-Swap HDD	40K1040
300GB 10K 3.5" SAS Hot-Swap HDD	40K1041
36GB 15K 3.5" SAS Hot-Swap HDD	40K1042
73GB 15K 3.5" SAS Hot-Swap HDD	40K1043
146GB 15K 3.5" SAS Hot-Swap HDD	40K1044
IBM Remote Supervisor Adapter II slimline	42C4178
IBM Simple-Swap SATA RAID Kit	42C1313
Other options at **ibm.com**/pc/us/accessories	

Rear

PCI slot1 PCI slot2

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

Top

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

Some:
Bay ① 3.5", SL 1", access, open for simple-swap/hot-swap disk
Bay ② 3.5", SL 1", access, open for simple-swap/hot-swap disk
Bay ③ 5.25", UltraSlim 0.5", access, std optical
Some:
Bay ① 2.5", SFF, access, open for hot-swap disk
Bay ② 2.5", SFF, access, open for hot-swap disk
Bay ③ 2.5", SFF, access, open for hot-swap disk
Bay ④ 2.5", SFF, access, open for hot-swap disk
Bay ⑤ 5.25", UltraSlim 0.5", access, std optical

➭ Raven black front bezel
➭ H 1.75" (1U) x W 17.32" x D 22"; 43mm x 440mm x 559mm
➭ 24.4 to 28 lbs; 11kg to 12.7kg (minimum to max configuration)
➭ Configuration/Setup Utility: F1 at startup
➭ Network Boot: F12 at startup
➭ Operator Information Panel in front
➭ Ships with Diagnostics CD, ServerGuide Setup and Installation CD
➭ Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Front

optical ① ②
or
optical ① ②
       ③ ④

LIMITED WARRANTY[3]

- 1 year parts and labor standard 4364 MTM
- 3 year parts and labor standard 4365 MTM
- International Warranty Service[3]
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):[7]
  - 3 year IOR 9x5, NBD avg response (ServicePac part num 69P9505)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9506)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9507)
  - 3 year IOR 24x7, 2 hr response (ServicePac part num 69P9508)
- Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf
- 24x7[14] toll-free support for warranty issues during the warranty period[3]

Maximum internal disk capacity[13] (model dependent):
1TB with two 500GB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks or 292GB with four 2.5" 73GB SAS disks

See footnotes for important warranty information

IBM® Type-GAV-model	Qty x Processor	Core	L2 cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (std/max)	Warranty	Power supply	Ethernet	Available date
7973/74-42y-42x	1x Xeon™ 5110 1.6GHz	DC	4MB	1GB	None	SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7973/74-52y-52x	1x Xeon 5120 1.86GHz	DC	4MB	1GB	None	SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7973/74-62y-62x	1x Xeon 5130 2.0GHz	DC	4MB	1GB	None	SATA	Tower	6x7 (4/4 SS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-42y-42x	1x Xeon 5110 1.6GHz	DC	4MB	1GB	None	SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-4Ay-4Ax	1x Xeon 5110 1.6GHz	DC	4MB	1GB	None	SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Aug 2006
7975/76-52y-52x	1x Xeon 5120 1.86GHz	DC	4MB	1GB	None	SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-5Ay-5Ax	1x Xeon 5120 1.86GHz	DC	4MB	1GB	None	SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Aug 2006
7975/76-62y-62x	1x Xeon 5130 2.0GHz	DC	4MB	1GB	None	SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 670W fixed	GB	Aug 2006
7975/76-6Ay-6Ax	1x Xeon 5130 2.0GHz	DC	4MB	1GB	None	SAS/SATA	Tower	6x11 (4/8 HS)	1/3yr	1 x 835W hot-swap	GB	Aug 2006

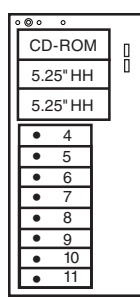|	
Positioning	*Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
Processor	Up to **1 x Intel® Xeon Processor 1.86 GHz** with 1066MHz FSB Dual Core / up to **1 x Intel® Xeon Processor 2.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)**
L2 cache	**4MB** / all models / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers
Memory	**1GB** std / 32GB[13] max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**
SAS/SATA controller	Some: **Adaptec® AIC-9580W** / **eight port SAS**(300MB/sec) **or SATA**(150MB/sec) / hot-swap / on planar / PCI-Express / supports **RAID 0, 1 &10** / ServeRAID 8k-I std ; Some: native SATA / on planar / PCI-Express / supports **RAID 0 & 1**
SAS connectors	Dual channel controller wired to hot-swap DASD backplane
SAS cabling	Mini SAS cable connects controller to 4-bay backplane
IDE controller / cable	IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (CD-ROM)
Disk - capacity	None std / supports 7200-15000 rpm disks / single backplane (upgradeable to dual backplanes)
Disk - bays	Some: four hot-swap SAS/SATA bays (upgradeable to eight); some: four simple-swap SATA bays
Mechanical	Tower / conversion to EIA 26" Rack (5U[4]) via optional kit 39Y8382
Slots (see below)	Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot
Chipset	**Intel 5000P chipset** / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O
Ethernet controller	**One** 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-Express / full duplex / Wake on LAN® / IPMI (2.0)
CD-ROM / diskette	48X[6] CD-ROM / IDE / 1.6" HH; Diskette: USB only
Rear ports	*Rear:* two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin),graphics (DB-15), one ethernet (RJ-45), RJ-45 (sys mgmt)
Front port / graphics	*Front:* two USB (Vers 2.0); *Graphics:* XVGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2
Security	Power-on password / administrator password / front door to cover disk bays and power button / unattended boot / selectable boot
Systems mgmt	**IBM Integrated Baseboard Management Controller**(BMC) / IPMI 2.0 H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)
Diagnostics	System error LED Panel in front
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, others
Keyboard / mouse	Optional
Power supply	*Some:* 670 watt / fixed / one std/max; *some:* 835 watt / hot-swap / one/two std/max / redundant with two; *all:* voltage-sensing / auto-restart
Fans	std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply

Xeon 1.6GHz/1066MHz/4MB L2 Cache Proc Upg	40K1231
Xeon 1.86GHz/1066MHz/4MB L2 Cache Proc Upg	40K1232
Xeon 2.0GHz/1333MHz/4MB L2 Cache Proc Upg	40K1233
1GB Kit (2x512MB DIMM) PC2-5300 DDR2 FBD CL4	39M5782
2GB Kit (2x1GB DIMM) PC2-5300 DDR2 FBD CL4	39M5785
4GB Kit (2x2GB DIMM) PC2-5300 DDR2 FBD CL4	39M5791
73GB 10K SAS Hot-Swap HDD	40K1039
146GB 10K SAS Hot-Swap HDD	40K1040
300GB 10K SAS Hot-Swap HDD	40K1041
36GB 15K SAS Hot-Swap HDD	40K1042
73GB 15K SAS Hot-Swap HDD	40K1043
146GB 15K SAS Hot-Swap HDD	40K1044
80GB 7.2K SATA Hot-Swap HDD	39M4518
160GB 7.2K SATA Hot-Swap HDD	39M4522
250GB 7.2K SATA Hot-Swap HDD	39M4526
80GB 7.2K SATA Simple-Swap HDD	39M4500
160GB 7.2K SATA Simple-Swap HDD	39M4504
250GB 7.2K SATA Simple-Swap HDD	39M4508
IBM Remote Supervisor Adapter II Slimline	39Y9566
IBM Redundant Power and Cooling Option(NA)	39Y8487
Other options at **www.ibm.com**/pc/us/accessories	

Bay 1 5.25", HH 1.6" access, CD-ROM
Bay 2 5.25", HH 1.6" access, open
Bay 3 5.25", HH 1.6" access, open
Hot-Swap SAS/SATA models:
Bay 4 3.5", SL 1", access, open
Bay 5 3.5", SL 1", access, open
Bay 6 3.5", SL 1", access, open
Bay 7 3.5", SL 1", access, open
Bay 8 3.5", SL 1", access, open
Bay 9 3.5", SL 1", access, open
Bay 10 3.5", SL 1", access, open
Bay 11 3.5", SL 1", access, open
Simple-Swap SATA models:
Bay 8 3.5", SL 1", access, open
Bay 9 3.5", SL 1", access, open
Bay 10 3.5", SL 1", access, open
Bay 11 3.5", SL 1", access, open

Tower

CD-ROM
5.25" HH
5.25" HH
4
5
6
7
8
9
10
11

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

⇨ Quick release adapter slots (no screws)
⇨ Configuration/Setup Utility invoked by pressing F1 at startup
⇨ RAID Configuration Utility near startup by pressing CTRL+A
⇨ ACPI 2.0-compliant
⇨ Operator Information Panel (in front)
⇨ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
⇨ Tower: H 17.3" x W 8.6" x D 29.4"
⇨ 42 to 84 pounds
⇨ Stealth black color

Hot-Swap models: Max internal disk capacity:
2.4TB[2] with eight 300GB 10K SAS or
4.0TB[2] with eight 500GB SATA hot-swap HDDs
Simple-Swap models: Max internal disk capacity:
1.0TB[2] with four 250GB SATA non-hot-swap HDDs

LIMITED WARRANTY[3]

⇨ **1 yr parts and labor 7973/7975 MTM**
⇨ **3 yr parts and labor 7974/7976 MTM**
⇨ **International Warranty Service**[3]
⇨ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
⇨ **3 year on site warranty service upgrade options (in eligible locations):**[7]
 • **9 hour coverage, Mon-Fri excluding holidays, 4 hour average response** (ServicePac® part num 21P2083)
 • **24 hr x 7 day coverage, 4 hour average response** (ServicePac part number 21P2084)
 • **24 hr x 7 day coverage, 2 hour average response** (ServicePac part number 21P2085)
⇨ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

IBM System x3455

IBM® Type-model	Qty x Processor	Speed/Core	L2 Cache	Optical	Memory	Disk / Controller	Disk bays	Slots x bays	Ethernet	Warranty[3] (years)	Available date
7984 - 11U	1 x Opteron™ 2210	1.8GHz/DC	2MB	None	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 31U	1 x Opteron 2214	2.2GHz/DC	2MB	CD-RW/DVD	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 41U	1 x Opteron 2216	2.4GHz/DC	2MB	None	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 51U	1 x Opteron 2218	2.6GHz/DC	2MB	None	2x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 52U	2 x Opteron 2216	2.6GHz/DC	2MB	None	4x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006
7984 - 6AU	2 x Opteron 2220SE	2.8GHz/DC	2MB	None	4x512MB	80GB/SATA	2 fixed	2x3	Dual Gigabit	1	Sept 2006

Positioning	**Entry 2-way rack server for compute-intesnsive applications and dual core computing at an attractive price**
Processor(s)	Up to two AMD® Opteron 2000 Series Dual Core Processors up to 2.8GHz[1] / simultaneously supports 32-bit and 64-bit computing
L2 cache	**1MB** / per core / at processor speed / Dual Core Capable
SMP support	**2-way SMP** / up to two Opteron Processors (same speed/cache size required)
Implementation	Systemboard contains two LGA 1207-pin sockets, twelve memory DIMM slots, integrated SATA, dual ethernet, graphics, one PCI-E x16 slot and either one PCI-E x8 or one HTx slot
Memory	**1 or 2 GB** std / 24GB max[13] per processor (48GB max per dual cpu system) / *single cpu system:* two slots used, four slots available; *dual cpu system:* four slots used, eight slots available / **PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs** / twelve DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / **Error Checking and Correcting (ECC)** via 16-bit Checksum / **Xcelerated Memory Technology**™ / **Chipkill**™ on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing
SATA disk controller	**Integrated SATA II controller** / provided by HT1000 South Bridge / two port / optional SAS / optional RAID
SATA controller/cable	Two connectors on planar / two 1-drop cables / one1-drop IDE cable(for optical drive)
Disk - capacity	80GB / 7200 rpm / 9.0ms seek
Disk - bays	*Two* 3.5" fixed / SATA connectors / filler panels in each disk bay / supports 15k drives
Mechanical	**EIA 19" Rack (1U[4])** / rack-mount only / supported in 26" deep racks such as the IBM NetBAY™ Rack products
Architecture/chipsets	**ServerWorks**™ **Chipset** / **HT2100 System I/O Controller** provides: one PCI-Express x16 slot, one PCI-Express x8 or one HTx slot, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: PCI-X, USB(2.0), ATI video, SATA, Dual GB ethernet, IDE and LPC bus to NS PC87427 for Super I/O
Bus slots	(See detail below) one half-length PCI-E x16 and one half-length PCI-E x8 / option to convert PCI-E x8 slot to HTx slot
Ethernet	Two gigabit 10/100/1000 ethernet ports / Broadcom® 5704 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 133MHz / full duplex / Wake on LAN® / two rear RJ-45 ports
Optical / diskette	Optional / IDE / *Diskette* none (USB diskette optional)
Rear ports	*Rear:* four USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45), analog DB-15 graphics / parallel port not supported
Front ports	*Front:* two USB (Vers 2.0)
Graphics	SVGA / ATI® RN50b(ES1000) / on planar / 16MB SDRAM std/max
Keyboard / mouse	None standard (because rack-based)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems mgmt	**IBM Integrated Baseboard Management Controller**(BMC) / H82166 / IPMI 2.0

Diagnostics	Diagnositic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported	
	Dual Core AMD Opteron Processor Model 2210	40K1208
	Dual Core AMD Opteron Processor Model 2214	40K1215
	Dual Core AMD Opteron Processor Model 2216	40K1210
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others	
	Dual Core AMD Opteron Processor Model 2218	40K1211
	Dual Core AMD Opteron Processor Model 2220SE	40K1209
	1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2759
	2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2762
Cooling	Five fans total / three blowers for processors, memory and HDD bays / two fans inside power supply / **Calibrated Vector Cooling**™ / variable speed / not redundant / not hot-swap	
	4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2765
	8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2768
	IBM 80GB 7.2K 3.5" SATA HDD	39M4500
	IBM 160GB 7.2K 3.5" SATA HDD	39M4504
	IBM 250GB 7.2K 3.5" SATA HDD	39M4508
	IBM 500GB 7.2K 3.5" SATA HDD	39M4514
Power supply	650 watt / universal / auto-sensing / auto-restart support	IBM 73GB 10K 3.5" SAS HDD*	40K1045
Prerequisites	Monitor, keyboard, mouse, rack, os	IBM 146GB 10K 3.5" SAS HDD*	40K1046

IBM 300GB 10K 3.5" SAS HDD*	40K1047
IBM 73GB 15K 3.5" SAS HDD*	40K1049
IBM 146GB 15K 3.5" SAS HDD*	40K1050
IBM SAS HBA Controller	25R8060
PCI-E x8 Riser Card	32R3288
HTx Riser Card	40K7462

Back

power supply   serial   usb   vga   ethernet

PCI-E slot 1   PCI-E slot 2

Top

Power Supply · Fan Fan · CPU · Systemboard · PCI-E slot #1 · PCI-E/HTx slot #2 · DIMM sockets · opt CPU · Disk 1 & Disk 2 (opt) · Optical (opt) · Blower Blower Blower · Service LED button

Front

optical (opt)   power button   status leds   usb
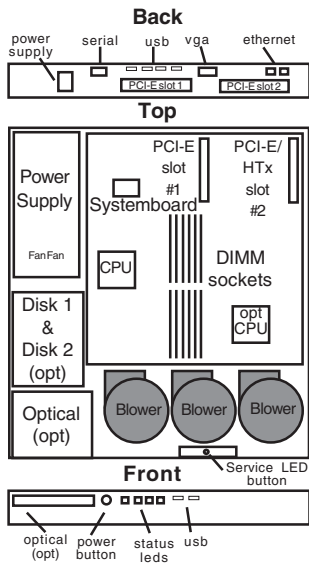
Maximum internal disk capacity[13]: 1TB with two 500GB SATA disks or 600GB with two 300GB SAS disks and optional* SAS controller

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

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

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

➪ Stealth black color front bezel
➪ H 1.72" (1U) x W 17.3" x D 25.7"
 H 43.7mm x W 439.9mm x L 653.3mm
➪ 26 to 32 lbs; 11.8kg to 14.6kg (minimum to max configuration)
➪ Configuration/Setup Utility: F1 at startup\
➪ Network Boot: F12 at startup
➪ Operator Information Panel in front
➪ Includes one line cord (9 ft universal interrack HV cable with IEC plug)
➪ Predictive Failure Analysis® on processor(s), voltage regulator modules, memory, fans, power supply, and disk options

*IBM SAS HBA Controller option required for SAS support

See footnotes for important warranty information

(x3455A) © IBM Corp. August 2006

IBM® Type-GAV-model	Qty x Processor	Core	L2 cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7977-12y-12x	1 x Xeon™ 5050 3.0GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-22y-22x	1 x Xeon 5060 3.2GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-42y-42x	1 x Xeon 5110 1.6GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-52y-52x	1 x Xeon 5120 1.86GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-62y-62x	1 x Xeon 5130 2.0GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-72y-72x	1 x Xeon 5140 2.33GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-82y-82x	1 x Xeon 5150 2.66GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006
7977-92y-92x	1 x Xeon 5160 3.0GHz	DC	4MB	1GB	None	SAS / SATA	Tower	6x11 (8 hot-swap std/max)	1 x 835W hot-swap	2xGigabit	Jul 2006

Positioning	*Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
Processor	Up to **1 x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.2 GHz** with 1066MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology
L2 cache	**2MB** / per core / all models / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers

Memory	**1GB** std / 48GB[13] max (48GB maximum can be achieved when 4GB DIMMs are supported, 24GB is the max with less than 4GB DIMMs) / two slots used / ten slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller	**Adaptec® AIC-9580W** / **eight port SAS or SATA** (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports **RAID 0, 1, 5 &10** / ServeRAID 8k std
SAS connectors	Dual channel controller wired to two hot-swap DASD backplanes
SAS cabling	Two mini SAS cables connect controller to dual 4-bay backplanes

IDE controller / cable	IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (DVD-ROM)
Disk - capacity	None std / supports 7200-15000 rpm disks / dual backplanes
Disk - bays	Eight hot-swap SAS/SATA bays

Mechanical	Tower / conversion to EIA 26" Rack (5U[4]) via optional kit 39Y8382
Slots (see below)	Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot
Chipset	**Intel 5000P chipset** / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O
Ethernet controller	**Dual** 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-Express 64-bit 100MHz / full duplex / Wake on LAN® / IPMI (2.0)

DVD-ROM / diskette	16X[6] DVD-ROM / IDE / 1.6" HH; *Diskette:* USB only
Rear ports	*Rear:* two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin),graphics (DB-15), two ethernet (RJ-45), RJ-45 (sys mgmt)
Front port / graphics	*Front:* two USB (Vers 2.0); *Graphics:* SVGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2

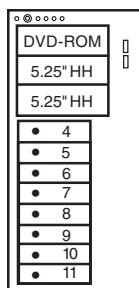|	
Security	Power-on password / administrator password / front door to cover disk bays and power button / unattended boot / selectable boot
Systems mgmt	**IBM Integrated Baseboard Management Controller**(BMC) / IPMI 2.0 H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)
Diagnostics	**Light Path Diagnostics™** panel providing LED map to failing part (on side cover) / Information LED Panel in front
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director, others

Keyboard / mouse	Optional
Power supply	835 watt / std/max: one/two / hot-swap / voltage-sensing / auto-restart / redundant with optional power supply
Fans	std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap / (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply

Option	Part number
Xeon 3.0GHz/667MHz/4MB L2 Cache Proc Upg	25R8926
Xeon 3.2GHz/1066MHz/4MB L2 Cache Proc Upg	25R8912
Xeon 1.6GHz/1066MHz/4MB L2 Cache Proc Upg	40K1231
Xeon 1.86GHz/1066MHz/4MB L2 Cache Proc Upg	40K1232
Xeon 2.0GHz/1333MHz/4MB L2 Cache Proc Upg	40K1233
Xeon 2.33GHz/1333MHz/4MB L2 Cache Proc Upg	40K1234
Xeon 2.66GHz/1333MHz/4MB L2 Cache Proc Upg	40K1235
Xeon 3.0GHz/1333MHz/4MB L2 Cache Proc Upg	40K1236
1GB Kit (2x512MB DIMM) PC2-5300 DDR2 FBD CL4	39M5782
2GB Kit (2x1GB DIMM) PC2-5300 DDR2 FBD CL4	39M5785
4GB Kit (2x2GB DIMM) PC2-5300 DDR2 FBD CL4	39M5791
73GB 10K SAS Hot-Swap HDD	40K1039
146GB 10K SAS Hot-Swap HDD	40K1040
300GB 10K SAS Hot-Swap HDD	40K1041
36GB 15K SAS Hot-Swap HDD	40K1042
73GB 15K SAS Hot-Swap HDD	40K1043
146GB 15K SAS Hot-Swap HDD	40K1044
80GB 7.2K SATA Hot-Swap HDD	39M4518
160GB 7.2K SATA Hot-Swap HDD	39M4522
250GB 7.2K SATA Hot-Swap HDD	39M4526
IBM Remote Supervisor Adapter II Slimline	39Y9566
IBM Redundant Power and Cooling Option(NA)	39Y8487

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

Tower

Bay 1   5.25", HH 1.6" access, DVD-ROM
Bay 2   5.25", HH 1.6" access, open
Bay 3   5.25", HH 1.6" access, open
Bay 4   3.5", SL 1", access, hot-swap
Bay 5   3.5", SL 1", access, hot-swap
Bay 6   3.5", SL 1", access, hot-swap
Bay 7   3.5", SL 1", access, hot-swap
Bay 8   3.5", SL 1", access, hot-swap
Bay 9   3.5", SL 1", access, hot-swap
Bay 10 3.5", SL 1", access, hot-swap
Bay 11 3.5", SL 1", access, hot-swap

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

⇨ Quick release adapter slots (no screws)
⇨ Configuration/Setup Utility invoked by pressing F1 at startup
⇨ Aurora RAID Configuration Utility near startup by pressing CTRL+A
⇨ ACPI 2.0-compliant
⇨ Operator Information Panel (in front)
⇨ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
⇨ Tower: H 17.3" x W 8.6" x D 29.4"
⇨ 74 to 101 pounds
⇨ Stealth black color

All models: Max internal disk capacity:
2.4TB[2] with eight 300GB 10K SAS or
2.0TB[2] with eight 250GB SATA hot-swap HDDs

LIMITED WARRANTY[3]

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

See footnotes for important warranty information   • = Hot-swap   (x3500A) © IBM Corp. June 2006

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
7978-G5y-G5x	1 x Xeon™ 5050 3.0GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	July 2006
7978-G6y-G6x	1 x Xeon 5050 3.0GHz/DC	4MB	1GB	(open 3.5)	SATA	Combo	670W	2 simple-swap	2x4	2 x GB	3 year	July 2006
7978-45y-45x	1 x Xeon 5080 3.73GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	July 2006
7978-4Sy-4Sx	1 x Xeon 5080 3.73GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	July 2006

Positioning — *A highly manageable, ultra-dense 1U, 2-way server delivering performance computing in space-constrained environments*

Processor — Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

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

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

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

Memory — **1GB** std / 32GB[13] max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller — **Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA** (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)

SAS connectors — One internal connection wired to DASD backplane

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

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

Disk - bays — Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical — **EIA 19" Rack (1U[4])** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion

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

Bus slots — (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

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

Optical / diskette — 8X-24X[6] CD-RW/DVD-ROM / USB only

Front & Rear ports — *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

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

Security — Power-on password / administrator password / unattended boot / selectable boot sequence

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

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

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

Keyboard / mouse — None standard (because rack-based) / USB only

Power supply — *Std/Max:* one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans — **Calibrated Vectored Cooling™** *Std:* ten fans; *Max:* twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA

Prerequisites — Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Option	Part #
Xeon 3.0GHz/667MHz - 2 x 2MB L2 Cache	25R8921
Xeon 3.73GHz/1066MHz - 2 x 2MB L2 Cache	25R8924
1GB PC2-5300 FBD (2 x 512MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	73P9341
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
670 Watt Hot-swap Power Supply Option (US)	32R2815
PCI Riser Card PCI-X Option	32R8216

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

• = Hot-swap (HS)

```
[2.5" disk][2.5" disk]                     CD-RW/DVD-ROM
[2.5" disk][2.5" disk]

[ • 3.5" disk ][ • 3.5" disk ]              CD-RW/DVD-ROM
```

Diagram labels: PCI-E Riser / Channels 2 & 3 DIMMS 5,6,7,8 / Channels 0 & 1 DIMMS 1,2,3,4 / RAID Opt Socket / MCH / CPU 1 / PCI-E and PCI-X Riser / ESB2 / CPU 2 / Power Supply 2 / ATI / Power Supply 1

➩ Quick release adapter slots (no screws)
➩ Configuration/Setup Utility: F1 at startup
➩ Diagnostics (PC-Doctor™): F2 at startup
➩ Network Boot: F12 at startup
➩ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
➩ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
➩ Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
➩ 28 to 35.5 pounds
➩ Stealth black color

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

Max internal disk capacity:
3.5" SAS models: 600GB[2] with two 300GB SL disks
2.5: SAS models: 292GB[2] with four 73.4GB SFF disks
3.5" SATA models: 1TB[2] with two 500GB SL disks

(X3550A) © IBM Corp. June 2006

IBM System x3550

xREF by STG Field Skills and Education Team

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
7978-21y-21x	1 x Xeon™ 5110 1.6GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-22y-22x	1 x Xeon 5110 1.6GHz/DC	4MB	1GB	(open 3.5)	SATA	Combo	670W	2 simple-swap	2x4	2 x GB	3 year	Aug 2006
7978-31y-31x	1 x Xeon 5120 1.86GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-32y-32x	1 x Xeon 5120 1.86GHz/DC	4MB	1GB	(open 3.5)	SATA	Combo	670W	2 simple-swap	2x4	2 x GB	3 year	Aug 2006
7978-3Ay-3Ax	1 x Xeon 5120 1.86GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	Aug 2006

Positioning — *A highly manageable, ultra-dense 1U, 2-way server delivering performance computing in space-constrained environments*

Processor — Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

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

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

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

Memory — **1GB** std / 32GB[13] max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller — **Adaptec® AIC-9580W** / **dual channel SAS controller** / **four port SAS or two port SATA** (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)

SAS connectors — One internal connection wired to DASD backplane

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

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

Disk - bays — Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay
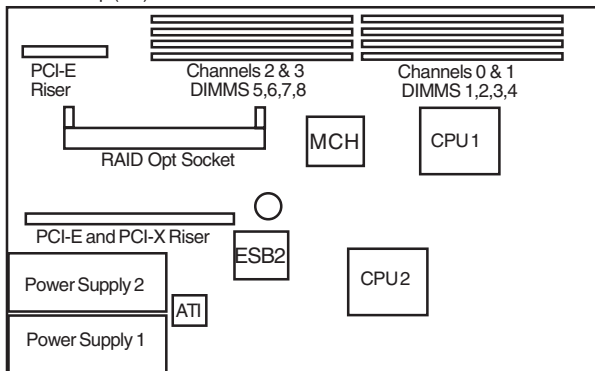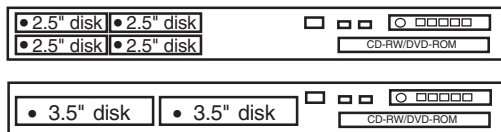
Mechanical — **EIA 19" Rack (1U[4])** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion

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

Bus slots — (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

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

Optical / diskette — 8X-24X[6] CD-RW/DVD-ROM / USB only

Front & Rear ports — *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

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

Security — Power-on password / administrator password / unattended boot / selectable boot sequence

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

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

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

Keyboard / mouse — None standard (because rack-based) / USB only

Power supply — *Std/Max:* one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans — **Calibrated Vectored Cooling™** *Std:* ten fans; *Max:* twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA

Prerequisites — Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Xeon 1.6GHz/1066MHz - 2 x 2MB L2 Cache	40K1237
Xeon 1.86GHz/1066MHz - 2 x 2MB L2 Cache	40K1238
1GB PC2-5300 FBD (2 x 512MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	73P9341
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
670 Watt Hot-swap Power Supply Option (US)	32R2815
PCI Riser Card PCI-X Option	32R8216

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

- 2.5" disk | 2.5" disk
- 2.5" disk | 2.5" disk
- CD-RW/DVD-ROM
- 3.5" disk | 3.5" disk | CD-RW/DVD-ROM
- • = Hot-swap (HS)

PCI-E Riser / Channels 2 & 3 DIMMS 5,6,7,8 / Channels 0 & 1 DIMMS 1,2,3,4 / RAID Opt Socket / MCH / CPU1 / PCI-E and PCI-X Riser / ESB2 / CPU2 / Power Supply 2 / ATI / Power Supply 1

➾ Quick release adapter slots (no screws)
➾ Configuration/Setup Utility: F1 at startup
➾ Diagnostics (PC-Doctor™): F2 at startup
➾ Network Boot: F12 at startup
➾ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
➾ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
➾ Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
➾ 28 to 35.5 pounds
➾ Stealth black color

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

See footnotes for important warranty information

Max internal disk capacity:
3.5" SAS models: 600GB[2] with two 300GB SL disks
2.5: SAS models: 292GB[2] with four 73.4GB SFF disks
3.5" SATA models: 1TB[2] with two 500GB SL disks

LIMITED WARRANTY[3]

➾ **3 year parts and labor**
➾ **International Warranty Service**[3]
➾ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
➾ **3 year on site warranty service upgrade options (in eligible locations):**[7]
  - **9 hr coverage, Mon-Fri excluding holidays, 4 hr response time** (ServicePac® 21P2172)
  - **24 hr x 7 day coverage, 4 hour average response time** (ServicePac 21P2173)
  - **24 hr x 7 day coverage, 2 hour average response time** (ServicePac 21P2074)
➾ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
➾ **24x7[14] toll-free support for warranty issues during the warranty period**[3]

(X3550B) © IBM Corp. June 2006

IBM System x3550

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
7978-41y-41x	1 x Xeon™ 5130 2.0GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-42y-42x	1 x Xeon 5130 2.0GHz/DC	4MB	1GB	(open 3.5)	SATA	Combo	670W	2 simple-swap	2x4	2 x GB	3 year	Aug 2006
7978-4Ay-4Ax	1 x Xeon 5130 2.0GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-51y-51x	1 x Xeon 5140 2.33GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-5Ay-5Ax	1 x Xeon 5140 2.33GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	Aug 2006

Positioning — *A highly manageable, ultra-dense 1U, 2-way server delivering performance computing in space-constrained environments*

Processor — Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

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

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

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

Memory — **1GB** std / 32GB[13] max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller — **Adaptec® AIC-9580W** / **dual channel SAS controller** / **four port SAS or two port SATA** (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)

SAS connectors — One internal connection wired to DASD backplane

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

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

Disk - bays — Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical — **EIA 19" Rack (1U[4])** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion

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

Bus slots — (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots
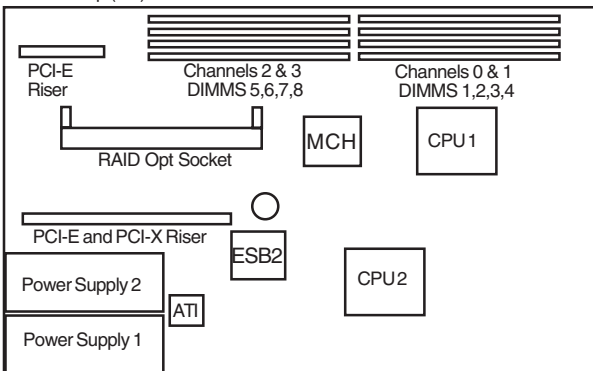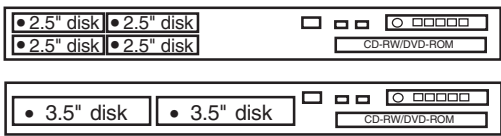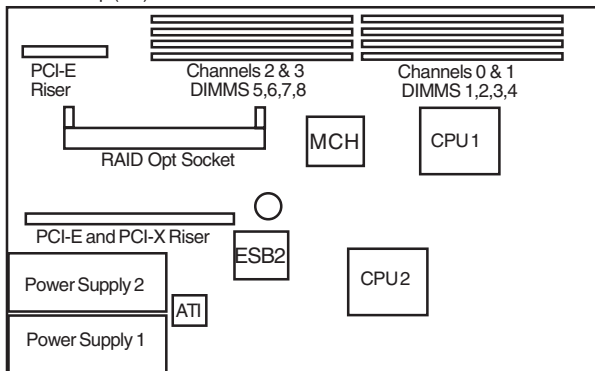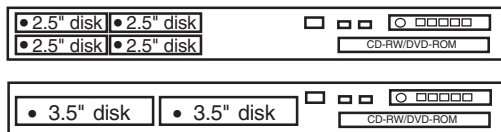
Ethernet controller — Two gigabit 10/100/1000 ethernet ports /**Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear

Optical / diskette — 8X-24X[6] CD-RW/DVD-ROM / USB only

Front & Rear ports — *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

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

Security — Power-on password / administrator password / unattended boot / selectable boot sequence

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

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

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

Keyboard / mouse — None standard (because rack-based) / USB only

Power supply — *Std/Max:* one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans — **Calibrated Vectored Cooling™** *Std:* ten fans; *Max:* twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA

Prerequisites — Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Option	Part #
Xeon 2.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1239
Xeon 2.33GHz/1333MHz - 2 x 2MB L2 Cache	40K1240
1GB PC2-5300 FBD (2 x 512MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	73P9341
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
670 Watt Hot-swap Power Supply Option (US)	32R2815
PCI Riser Card PCI-X Option	32R8216

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

• = Hot-swap (HS)

RAID Opt Socket

PCI-E and PCI-X Riser

Power Supply 2

Power Supply 1

➪ Quick release adapter slots (no screws)
➪ Configuration/Setup Utility: F1 at startup
➪ Diagnostics (PC-Doctor™): F2 at startup
➪ Network Boot: F12 at startup
➪ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
➪ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
➪ Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
➪ 28 to 35.5 pounds
➪ Stealth black color

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

See footnotes for important warranty information

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

(X3550C) © IBM Corp. June 2006

IBM System x3550

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Limited warranty[3]	Available date
7978-61y-61x	1 x Xeon™ 5150 2.66GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-6Ay-6Ax	1 x Xeon 5150 2.66GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-71y-71x	1 x Xeon 5160 3.0GHz/DC	4MB	1GB	(open 3.5)	SAS/SATA	Combo	670W	2 hot-swap	2x4	2 x GB	3 year	Aug 2006
7978-7Ay-7Ax	1 x Xeon 5160 3.0GHz/DC	4MB	1GB	(open 2.5)	SAS/SATA	Combo	670W	4 hot-swap	2x4	2 x GB	3 year	Aug 2006

Positioning *A highly manageable, ultra-dense 1U, 2-way server delivering performance computing in space-constrained environments*

Processor Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.73 GHz** with 1066MHz FSB Dual Core / **1x Intel® Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

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

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

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

Memory **1GB** std / 32GB[13] max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

SAS/SATA controller **Adaptec® AIC-9580W** / **dual channel SAS controller** / **four port SAS or two port SATA** (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)

SAS connectors One internal connection wired to DASD backplane

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

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

Disk - bays Some: two hot-swap 3.5" SAS HDD ; some: four hot-swap 2.5" SAS HDD ; some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

Mechanical **EIA 19" Rack (1U[4])** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion

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

Bus slots (See below) one PCI-Express x8 (x8 Links) / one PCI-X 1.0 or one PCI-Express x8 (x4 Links) / no hot-swap Active™ PCI slots

Ethernet controller Two gigabit 10/100/1000 ethernet ports /**Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
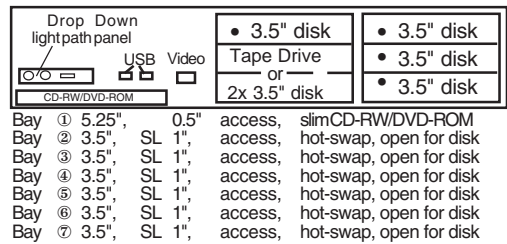
Optical / diskette 8X-24X[6] CD-RW/DVD-ROM / USB only

Front & Rear ports *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

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

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

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

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

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

Keyboard / mouse None standard (because rack-based) / USB only

Power supply *Std/Max:* one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans **Calibrated Vectored Cooling™** *Std:* ten fans; *Max:* twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA

Prerequisites Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Xeon 2.66GHz/1333MHz - 2 x 2MB L2 Cache	40K1241
Xeon 3.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1242
1GB PC2-5300 FBD (2 x 512MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	73P9341
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
670 Watt Hot-swap Power Supply Option (US)	32R2815
PCI Riser Card PCI-X Option	32R8216

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

- 2.5" disk / 2.5" disk / CD-RW/DVD-ROM
- 2.5" disk / 2.5" disk
- 3.5" disk / 3.5" disk / CD-RW/DVD-ROM

• = Hot-swap (HS)

PCI-E Riser — Channels 2 & 3 DIMMS 5,6,7,8 — Channels 0 & 1 DIMMS 1,2,3,4

RAID Opt Socket — MCH — CPU1

PCI-E and PCI-X Riser — ESB2 — CPU2

Power Supply 2 — ATI

Power Supply 1

- ➮ Quick release adapter slots (no screws)
- ➮ Configuration/Setup Utility: F1 at startup
- ➮ Diagnostics (PC-Doctor™): F2 at startup
- ➮ Network Boot: F12 at startup
- ➮ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
- ➮ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- ➮ Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
- ➮ 28 to 35.5 pounds
- ➮ Stealth black color

LIMITED WARRANTY[3]

- ➮ **3 year parts and labor**
- ➮ **International Warranty Service**[3]
- ➮ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
- ➮ **3 year on site warranty service upgrade options (in eligible locations):**[7]
  - • **9 hr coverage, Mon-Fri excluding holidays, 4 hr response time** (ServicePac® 21P2172)
  - • **24 hr x 7 day coverage, 4 hour average response time** (ServicePac 21P2173)
  - • **24 hr x 7 day coverage, 2 hour average response time** (ServicePac 21P2074)
- ➮ **Other ServicePac options at http://www.ibm.com/services/us/its/ pdf/wamomxeu.pdf**
- ➮ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

See footnotes for important warranty information

Max internal disk capacity:
3.5" SAS models: 600GB[2] with two 300GB SL disks
2.5: SAS models: 292GB[2] with four 73.4GB SFF disks
3.5" SATA models: 1TB[2] with two 500GB SL disks

(X3550D) © IBM Corp. June 2006

IBM® Type-GAV-model	Qty x Processor	Core	L2 cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-G5y-G5x	1 x Xeon™ 5050 3.0GHz DC		4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-GSy-GSx	1 x Xeon 5050 3.0GHz DC		4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-H5y-H5x	1 x Xeon 5063 3.2GHz DC		4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-HSy-HSx	1 x Xeon 5063 3.2GHz DC		4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006

Positioning — *A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*

Processor — Up to **1x Intel® Xeon Processor 3.0 GHz** with 667MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.2 GHz** with 1066MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

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

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

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

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

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

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

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

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

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

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

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

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

Bus slots — (See below) Two PCI-Express x8 (x4 Links) / Two PCI-X 1.0 or two PCI-Express x8 (x8 Links) / no hot-swap Active™ PCI slots

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

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

Front & Rear ports — *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port

Graphics — SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3
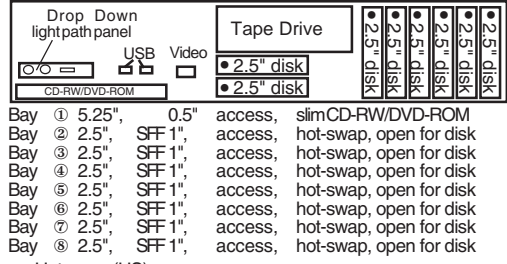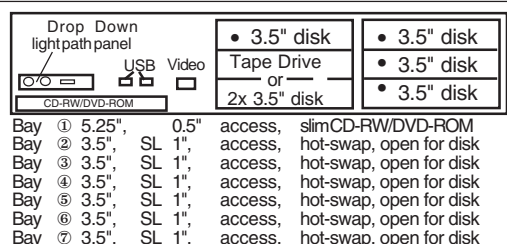
Security — Power-on password / administrator password / unattended boot / selectable boot sequence

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

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

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

Keyboard / mouse — None standard (because rack-based) / USB only

Power supply — *Std/Max:* one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans — **Calibrated Vectored Cooling™** *Std:* five fans; *Max:* ten (five fans with optional second power supply) / redundant with ten fans installed;*All:* variable speed / hot-swap / PFA

Prerequisites — Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Xeon 3.0GHz/667MHz - 2 x 2MB L2 Cache	25R8926
Xeon 3.2GHz/1066MHz - 2 x 2MB L2 Cache	25R8927
1GB PC2-5300 FBD (2 x 512MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	39Y9566
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
835 Watt Hot-swap Power Supply Option (US)	40K1905
835 Watt Hot-swap Power Supply Option (WW)	40K1906
PCI Riser Card PCI-Express Option	40K1907
PCI Riser Card PCI-X Option	40K1908

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

Drop Down light path panel / USB / Video / CD-RW/DVD-ROM

- 3.5" disk
- Tape Drive or 2x 3.5" disk
- 3.5" disk
- 3.5" disk
- 3.5" disk

2U Rack with 3.5" SAS

Bay ① 5.25",   0.5" access,   slimCD-RW/DVD-ROM
Bay ② 3.5",   SL 1", access, hot-swap, open for disk
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

Drop Down light path panel / USB / Video / CD-RW/DVD-ROM

- Tape Drive
- 2.5" disk
- 2.5" disk
- 2.5" disk / 2.5" disk / 2.5" disk / 2.5" disk / 2.5" disk / 2.5" disk

2U Rack with 2.5" SAS

Bay ① 5.25",   0.5" access,   slimCD-RW/DVD-ROM
Bay ② 2.5",   SFF 1", access, hot-swap, open for disk
Bay ③ 2.5",   SFF 1", access, hot-swap, open for disk
Bay ④ 2.5",   SFF 1", access, hot-swap, open for disk
Bay ⑤ 2.5",   SFF 1", access, hot-swap, open for disk
Bay ⑥ 2.5",   SFF 1", access, hot-swap, open for disk
Bay ⑦ 2.5",   SFF 1", access, hot-swap, open for disk
Bay ⑧ 2.5",   SFF 1", access, hot-swap, open for disk

• = Hot-swap (HS)

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

See footnotes for important warranty information

➪ Quick release adapter slots (no screws)
➪ Configuration/Setup Utility: F1 at startup
➪ Diagnostics (PC-Doctor™): F2 at startup
➪ Network Boot: F12 at startup
➪ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
➪ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
➪ Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)
➪ 46.5 to 65 pounds
➪ Stealth black color

Max internal disk capacity:
3.5" SAS models: 1.8TB² with six 300GB SL disks
2.5: SAS models: 584GB² with eight 73.4GB SFF disks

(X3650A) © IBM Corp. May 2006

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-21y-21x	1 x Xeon™ 5110 1.6GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-2Ay-2Ax	1 x Xeon 5110 1.6GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-31y-31x	1 x Xeon 5120 1.86GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-3Ay-3Ax	1 x Xeon 5120 1.86GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-41y-41x	1 x Xeon 5130 2.0GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-4Ay-4Ax	1 x Xeon 5130 2.0GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006

Positioning *A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*

Processor Up to **1x Intel® Xeon Processor 1.86 GHz** with 1066MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)

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

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

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

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

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

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

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

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

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

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

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

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

Bus slots (See below) Two PCI-Express x8 (x4 Links) / Two PCI-X 1.0 or two PCI-Express x8 (x8 Links) / no hot-swap Active™ PCI slots

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

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

Front & Rear ports *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port

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

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

Systems mgmt **IBM Integrated Baseboard Management Controller**(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)
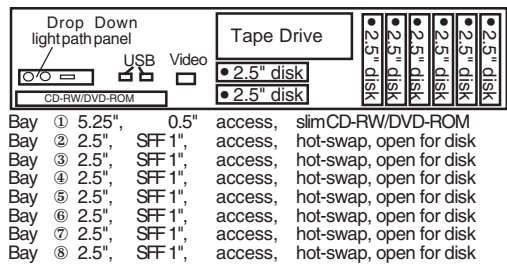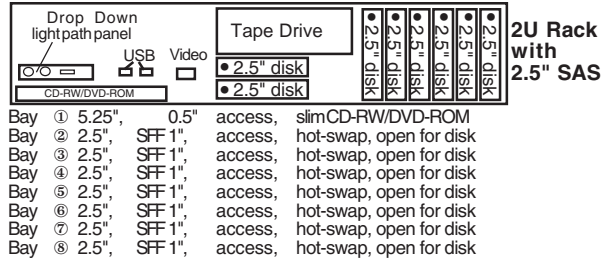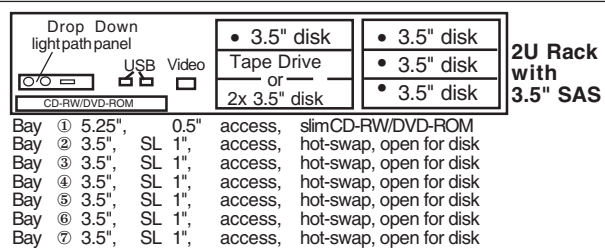
Diagnostics **Drop down Light Path Diagnostics** panel providing LED map to failing part (located on front panel)

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

Keyboard / mouse None standard (because rack-based) / USB only

Power supply *Std/Max:* one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans **Calibrated Vectored Cooling™** *Std:* five fans; *Max:* ten (five fans with optional second power supply) / redundant with ten fans installed; *All:* variable speed / hot-swap / PFA

Prerequisites Monitor, keyboard, mouse, SAS/SATA disk, rack, OS

Option	Part #
Xeon 1.60GHz/1066MHz - 2 x 2MB L2 Cache	40K1231
Xeon 1.86GHz/1066MHz - 2 x 2MB L2 Cache	40K1232
Xeon 2.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1233
1GB PC2-5300 FBD (2 x 512 MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	39Y9566
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
835 Watt Hot-swap Power Supply Option (US)	40K1905
PCI Riser Card PCI-Express Option	40K1907
PCI Riser Card PCI-X Option	40K1908

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

2U Rack with 3.5" SAS

- Drop Down light path panel
- USB Video
- CD-RW/DVD-ROM
- 3.5" disk / Tape Drive or 2x 3.5" disk
- 3.5" disk / 3.5" disk / 3.5" disk

Bay ① 5.25",	0.5"	access,	slimCD-RW/DVD-ROM	
Bay ② 3.5",	SL 1",	access,	hot-swap, open for disk	
Bay ③ 3.5",	SL 1",	access,	hot-swap, open for disk	
Bay ④ 3.5",	SL 1",	access,	hot-swap, open for disk	
Bay ⑤ 3.5",	SL 1",	access,	hot-swap, open for disk	
Bay ⑥ 3.5",	SL 1",	access,	hot-swap, open for disk	
Bay ⑦ 3.5",	SL 1",	access,	hot-swap, open for disk	

2U Rack with 2.5" SAS

- Drop Down light path panel
- USB Video
- CD-RW/DVD-ROM
- Tape Drive
- 2.5" disk / 2.5" disk
- 2.5" disk / 2.5" disk / 2.5" disk / 2.5" disk / 2.5" disk / 2.5" disk

Bay ① 5.25",	0.5"	access,	slimCD-RW/DVD-ROM	
Bay ② 2.5",	SFF 1",	access,	hot-swap, open for disk	
Bay ③ 2.5",	SFF 1",	access,	hot-swap, open for disk	
Bay ④ 2.5",	SFF 1",	access,	hot-swap, open for disk	
Bay ⑤ 2.5",	SFF 1",	access,	hot-swap, open for disk	
Bay ⑥ 2.5",	SFF 1",	access,	hot-swap, open for disk	
Bay ⑦ 2.5",	SFF 1",	access,	hot-swap, open for disk	
Bay ⑧ 2.5",	SFF 1",	access,	hot-swap, open for disk	

• = Hot-swap (HS)

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

See footnotes for important warranty information

➢ Quick release adapter slots (no screws)
➢ Configuration/Setup Utility: F1 at startup
➢ Diagnostics (PC-Doctor™): F2 at startup
➢ Network Boot: F12 at startup
➢ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
➢ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
➢ Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)
➢ 46.5 to 65 pounds
➢ Stealth black color

Max internal disk capacity:
3.5" SAS models: 1.8TB² with six 300GB SL disks
2.5: SAS models: 584GB² with eight 73.4GB SFF disks

(X3650B) © IBM Corp. June 2006

IBM System x3650

IBM® Type-GAV-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7979-51y-51x	1 x Xeon™ 5140 2.33GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-5Ay-5Ax	1 x Xeon 5140 2.33GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-61y-61x	1 x Xeon 5150 2.66GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-6Ay-6Ax	1 x Xeon 5150 2.66GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-71y-71x	1 x Xeon 5160 3.0GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x7 (4 or 6 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006
7979-7Ay-7Ax	1 x Xeon 5160 3.0GHz	DC 4MB	1GB	None	SAS / SATA	Rack	4x10 (8 hot-swap)	1 x 835W Hot-Swap	2xGigabit	Jul 2006

Positioning	*A rack-dense 2-way server delivering high availability, scalability and expandability for application-serving Web environments*
Processor	Up to **1x Intel® Xeon Processor 1.86 GHz** with 1066MHz FSB Dual Core / Up to **1 x Intel Xeon Processor 3.0 GHz** with 1333MHz FSB Dual Core / **Extended Memory 64 Technology (EM64T)** / Hyper-Threading technology / Enhanced Intel Speedstep Technology (EIST)
L2 cache	**2 MB** / per core / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers
Memory	**1GB** std / 48GB[13] max / two slots used / ten slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**
SAS/SATA controller	**Adaptec® AIC-9580W** / **dual channel SAS controller** / **eight port SAS or SATA** (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports **RAID 0, 1 & 10** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector)
SAS connectors	One internal connection wired to DASD backplane / one external connector
IDE controller/cable	Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM)
Disk - capacity	None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays	Some: six hot-swap 3.5" SAS HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in each disk bay
Tape backup	Optional internal and external / 3.5" / USB or SATA
Mechanical	**EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Chipset	**Intel 5000P chipset** / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O
Bus slots	(See below) Two PCI-Express x8 (x4 Links) / Two PCI-X 1.0 or two PCI-Express x8 (x8 Links) / no hot-swap Active™ PCI slots
Ethernet controller	Dual gigabit 10/100/1000 ethernet ports /**Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette	8X-24X⁶ CD-RW/DVD-ROM / USB only
Front & Rear ports	*Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* four USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt), one SAS / no parallel port
Graphics	SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3
Security	Power-on password / administrator password / unattended boot / selectable boot sequence
Systems mgmt	**IBM Integrated Baseboard Management Controller**(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no external power required)

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

Option	Part #
Xeon 2.33GHz/1333MHz - 2 x 2MB L2 Cache	40K1234
Xeon 2.66GHz/1333MHz - 2 x 2MB L2 Cache	40K1235
Xeon 3.0GHz/1333MHz - 2 x 2MB L2 Cache	40K1236
1GB PC2-5300 FBD (2 x 512 MB)	39M5782
2GB PC2-5300 FBD (2 x 1GB)	39M5785
4GB PC2-5300 FBD (2 x 2GB)	39M5791
8GB PC2-5300 FBD (2 x 4GB) - When available	39M5797
IBM ServeRAID-8k Adapter	25R8064
IBM Remote Supervisor Adapter II Slim	39Y5566
300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD	40K1041
73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD	40K1052
73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1043
146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD	40K1044
835 Watt Hot-swap Power Supply Option (US)	40K1905
PCI Riser Card PCI-Express Option	40K1907
PCI Riser Card PCI-X Option	40K1908

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

```
Drop Down light path panel    [ • 3.5" disk ]   [ • 3.5" disk ]   2U Rack
USB  Video     Tape Drive      [ • 3.5" disk ]   with
                  or            [ • 3.5" disk ]   3.5" SAS
CD-RW/DVD-ROM   2x 3.5" disk
```

Bay ①	5.25",	0.5"	access,	slimCD-RW/DVD-ROM
Bay ②	3.5",	SL 1",	access,	hot-swap, open for disk
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

```
Drop Down light path panel    Tape Drive    [2.5"|2.5"|2.5"|2.5"|2.5" disk]   2U Rack
USB  Video                     • 2.5" disk                                     with
                               • 2.5" disk   [2.5"|2.5"|2.5" disk]             2.5" SAS
CD-RW/DVD-ROM
```

Bay ①	5.25",	0.5"	access,	slimCD-RW/DVD-ROM
Bay ②	2.5",	SFF 1",	access,	hot-swap, open for disk
Bay ③	2.5",	SFF 1",	access,	hot-swap, open for disk
Bay ④	2.5",	SFF 1",	access,	hot-swap, open for disk
Bay ⑤	2.5",	SFF 1",	access,	hot-swap, open for disk
Bay ⑥	2.5",	SFF 1",	access,	hot-swap, open for disk
Bay ⑦	2.5",	SFF 1",	access,	hot-swap, open for disk
Bay ⑧	2.5",	SFF 1",	access,	hot-swap, open for disk

• = Hot-swap (HS)

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

See footnotes for important warranty information

Max internal disk capacity:
3.5" SAS models: 1.8TB² with six 300GB SL disks
2.5: SAS models: 584GB² with eight 73.4GB SFF disks

- ➭ Quick release adapter slots (no screws)
- ➭ Configuration/Setup Utility: F1 at startup
- ➭ Diagnostics (PC-Doctor™): F2 at startup
- ➭ Network Boot: F12 at startup
- ➭ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
- ➭ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- ➭ Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)
- ➭ 46.5 to 65 pounds
- ➭ Stealth black color

LIMITED WARRANTY³

- ➭ **3 year parts and labor**
- ➭ **International Warranty Service**³
- ➭ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**⁷
- ➭ **3 year on site warranty service upgrade options (in eligible locations):**⁷
  - **9 hr coverage, Mon-Fri excluding holidays, 4 hr response time** (ServicePac® 21P2077)
  - **24 hr x 7 day coverage, 4 hour average response time** (ServicePac 21P2078)
  - **24 hr x 7 day coverage, 2 hour average response time** (ServicePac 21P2093)
- ➭ **Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ➭ **24x7**¹⁴ **toll-free support for warranty issues during the warranty period**³

(X3650C) © IBM Corp. June 2006

IBM Type-model	Qty x Processor	L2 cache	Memory	Ultra320 SCSI disk	SCSI controller	Mechanical	Slots x bays	Disk Bays	Alarm Panel	Power supply	Compliant	Available date
7980-52X	2 x Xeon™ 3.2GHz	2MB	1GB	Open	2 x Ultra320	2U⁴ rack	6x3	2 HS	Yes	DC power	NEBS-3	May 2006
7980-53X	2 x Xeon 3.2GHz	2MB	2GB	Open	2 x Ultra320	2U rack	6x3	2 HS	Yes	AC power		May 2006
7980-54X	2 x Xeon 3.2GHz	2MB	2GB	2 x 146.8GB²10K	2 x Ultra320	2U rack	6x3	2 HS	Yes	DC power	NEBS-3	May 2006
7980-55X	2 x Xeon 3.2GHz	2MB	2GB	2 x 146.8GB 10K	2 x Ultra320	2U rack	6x3	2 HS	Yes	AC power		May 2006

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

Positioning	*High performance, carrier grade reliability for providers of the Next Generation Network*
Processor(s)	**2 x Intel® Xeon 3.2GHz with 800MHz FSB / Optimized for Extended Memory 64 Technology™** (EM64T) / Hyper-Threading
L2 cache	**2MB** std and max / ECC / at processor speed
Implementation	Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, six DIMM sockets, two PCI riser connectors, and integrated subsystems
SMP support	**2-way SMP** via second identical processor is standard

Memory	**Up to 2GB std / 16GB¹³ max** / PC2-3200 400MHz registered 240-pin ECC DDR2-SDRAM DIMMs / Six DIMM gold-connector slots on systemboard / Two sockets used / Four sockets available / ships with two 512 GB or 1GB DIMMs / DIMMs must be installed in matched pairs [a bank] / two-way memory interleave / dual-channel / **Error Checking and Correcting** (ECC) / **Active Memory™**: online spare and memory mirror / **Chipkill™** supported

SCSI disk controller	**LSI® LSI53C1030 / Ultra320 SCSI controller** (LVD 320MB/sec) / dual-channel / on planar / 64-bit PCI / Fusion-MPT™ architecture
SCSI channels	*SCSI Channel A:* one internal 16-bit 80-pin LVD cable from controller to two-bay disk drive carrier
	SCSI Channel B: external 16-bit .8mm VHDCI 68-pin external connector (no cables)
SCSI disk	**Up to two 146.8GB** Ultra320 SCSI, 10K rpm, 4.9ms read seek, S.M.A.R.T.⁵ / RAID 0 and 1
SCSI disk bays	Two hot-swap disk bays in disk drive carriers that slides out from front
IDE controller / cable	EIDE ATA-100 controller in South Bridge / one connector on planar / one 1-drop IDE cable (to CD-DVD ROM)

Mechanical	**EIA 19" Rack (2U⁴) x 20-inch deep**
Rack support	Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit
PCI bus slots	(See below) three full height full length 64-bit 133MHz slots / three low-profile half length 64-bit 66MHz PCI slots / PCI 2.2 / peer PCI buses / no hot-swap Active™ PCI slots
Chipset	**Intel® E7520 chipset** / Intel Memory Controller Hub (MCH) / E7520 North Bridge / PXH I/O bridge / ICH-5R S South Bridge / 3 PCI buses (one 64-bit/100MHz PCI-X supporting: SCSI and full-length PCI riser board, one 64-bit/100MHz PCI-X supporting: Ethernet and low-profile PCI riser board and one 32-bit/33MHz PCI supporting graphics) / LPC bus for NS PC87431M for mBMC and NS PC87427 for Super I/O (serial, keyboard, mouse)

Bays	(See diagram below): 3 bays / two disk bays (hot-swap) / one peripheral drive bay
Ethernet	Dual Gigabit 10/100/1000 ethernet ports / Intel 82546 / on planar / full-duplex / supports Wake on LAN®, PXE 3.0 Boot Agent, Adapter Fault Tolerance, Failover
DVD-ROM / diskette	24X-10X⁶ slim-line CD-DVD ROM / USB only
Ports	*Rear:* Two USB ports (Ver 2.0); RJ-45 serial; combo keyboard and mouse; two RJ-45 ethernet; DB-15 graphics; 68-pin SCSI; DB-15 male connector for front panel alarm relay contacts / no parallel port
	Front: One USB (Ver 2.0); RJ-45 serial

Graphics controller	SVGA / PCI bus / ATI® Rage XL (on planar) / 16MB SDRAM std/max / 1600x1200 at 16M colors at 85Hz / DB-15

Security	Power-on password / admin password / unattended boot / selectable boot / boot without keyboard

Alarm panel	**External alarm panel** in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault
Status LEDs	**Operator Information Panel** (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)
Systems mgmt	**Integrated service processor** (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /

OS support	Microsoft® Windows™ Server 2003, Enterprise Edition / Red Hat® Enterprise Linux 3 & 4 AS / SUSE® Linux Enterprise Server 9
Software ship group	Resource CD (CD-ROM installation and configuration utilities, Intel Server Control server management software, Product Guide)

Keyboard / mouse	None (since rack-based)
Power supply	*Std/Max:* two / rear accessible / **AC 600 watt (220V) or DC 600 watt (-48 to -60 V dc)** / supports dual input sources / **(1+1) redundant / hot-swap** / auto-restart support

Options available via special Bid

Fans	Four fans / multispeed / not hot-swap / not redundant / fan failure signals front panel alarm LED / fan in each power supply / fan on each processor
Prerequisites	Appropriate DC power source and customer supplied wiring, monitor, keyboard, mouse, rack, operating system

Slot 1: fullsize,   64-bit 100MHz PCI-X (5V)
Slot 2: fullsize,   64-bit 100MHz PCI-X (5V)
Slot 3: fullsize,   64-bit 100MHz PCI-X (5V)
Slot 4: low-profile, 64-bit 133MHz PCI-X (3.3V)
Slot 5: low-profile, 64-bit 133MHz PCI-X (3.3V)
Slot 6: low-profile, 64-bit 133MHz PCI-X (3.3V)

CD-ROM

disk bay   disk bay   **2U Rack**

Bay ② 3.5", 0.5", access, std CD-DVD ROM
Bay ③ 3.5", SL 1", access, some std disk
Bay ④ 3.5", SL 1", access, some std disk

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

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

LIMITED WARRANTY³
↪ **3/3 year parts and labor**
↪ **International Warranty Service³**
↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
↪ **2 year on site warranty service upgrade options (in eligible locations):⁷**
   • **9 hr coverage, Mon-Fri excluding holidays, 4 hr response time 96P2122**
   • **24 hr x 7 day coverage, 4 hour average response time 96P2123**
   • **24 hr x 7 day coverage, 2 hour average response time 96P2124**
↪ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

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

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

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

Memory	**1 GB** std / 32GB max[13] per processor (64GB max per dual cpu system) / *single cpu system:* two slots used, six slots available; *dual cpu system:* four slots used, twelve slots available / **PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs** / sixteen DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / **Error Checking and Correcting (ECC)** via 16-bit Checksum / **Xcelerated Memory Technology**™ / **Chipkill**™ on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

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

Mechanical	**EIA 19" Rack (2U[4])** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Chipset	**ServerWorks™ Chipset** / **HT2100 System I/O Controller** provides: two PCI-Express x8 slot, one PCI-Express x4 slot, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: PCI-X, USB(2.0), ATI video, SATA, Dual GB ethernet, IDE and LPC bus to NS PC87427 for Super I/O
Bus slots	(See detail below) one full-height, full-length HTx, two low profile PCI-E x8 and one low profile PCI-E x4 / option to convert HTx to PCI-X or PCI-E x16 slot
Ethernet	Two gigabit 10/100/1000 ethernet ports / Broadcom® 5706 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-X 64-bit 100MHz / TCP/IP offload engine (TOE) / full duplex / Wake on LAN® / two rear RJ-45 ports
Optical / diskette	24x/10x/24x/8x CD-RW/DVD / IDE / *Diskette* none (USB diskette optional)
Ports	*Front:* two USB (Vers 2.0), DB-15 graphics / *Rear:* four USB (Vers 2.0), serial (9-pin), two ethernet (RJ-45), system management (RJ-45), analog DB-15 graphics / parallel port not supported
Graphics	SVGA / ATI® ES1000(RN50b) / on planar / 16MB SDRAM std/max
Keyboard / mouse	None standard (because rack-based) / USB only

Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems mgmt	**IBM Integrated Baseboard Management Controller** (BMC) / H82166 / IPMI 2.0 / **PowerExecutive**™
Diagnostics	**Drop down Light Path Diagnostics** panel providing LED map to failing part (located on front panel)
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director™, and others

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

Dual Core AMD Opteron Processor Model 2210	25R8938
Dual Core AMD Opteron Processor Model 2212	25R8939
Dual Core AMD Opteron Processor Model 2216	25R8940
Dual Core AMD Opteron Processor Model 2218	40K1212
1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2759
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2762
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2765
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM Kit	41Y2768
IBM 73GB 10K 3.5" SAS Hot-Swap HDD*	40K1039
IBM 146GB 10K 3.5" SAS Hot-Swap HDD*	40K1040
IBM 300GB 10K 3.5" SAS Hot-Swap HDD*	40K1041
IBM 36GB 15K 3.5" SAS Hot-Swap HDD*	40K1042
IBM 73GB 15K 3.5" SAS Hot-Swap HDD*	40K1043
IBM 146GB 15K 3.5" SAS Hot-Swap HDD*	40K1044
IBM 36GB 15K SAS SFF Hot-Swap HDD*	40K1051
IBM 73GB 15K SAS SFF Hot-Swap HDD*	40K1052
IBM 500GB 7.2K 3.5" SATA Hot-Swap HDD*	39M4530
IBM SAS HBA Controller	25R8060
PCI-E x16 Riser Card	40K7428
PCI-X Riser Card	40K7427
IBM Remote Supervisor Adapter II Slimline	39Y5566
IBM ServeRAID 8k SAS Controller	25R8064
Qlogic Infinipath HTx Infiniband Adapter	41Y4519
835W Redundant Power Supply (US)	40K1905

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

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

- ↪ Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED
- ↪ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure

2U Rack with 2.5" SAS

Drop Down light path panel
USB   Video
CD-RW/DVD-ROM
Tape Drive
• 2.5" disk
• 2.5" disk
2.5" disk (x6)

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

Maximum internal disk capacity[13]:
3TB with six 500GB SATA disks or
1.8TB with six 300GB SAS disks

• = Hot-swap (HS)

2U Rack with 3.5" SAS/SATA
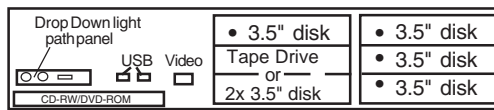
Drop Down light path panel
USB   Video
CD-RW/DVD-ROM
Tape Drive or 2x 3.5" disk
• 3.5" disk
• 3.5" disk
• 3.5" disk
• 3.5" disk

Bay ①	5.25",	0.5"	access,	slim CD-RW/DVD-ROM
Bay ②	3.5",	SL 1",	access,	hot-swap, open for disk
Bay ③	3.5",	SL 1",	access,	hot-swap, open for disk
Bay ④	3.5",	SL 1",	access,	hot-swap, open for disk
Bay ⑤	3.5",	SL 1",	access,	hot-swap, open for disk
Bay ⑥	3.5",	SL 1",	access,	hot-swap, open for disk
Bay ⑦	3.5",	SL 1",	access,	hot-swap, open for disk

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

LIMITED WARRANTY[3]

- ↪ **3 year parts and labor**
- ↪ **International Warranty Service**[3]
- ↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
- ↪ **On site service upgrade options (in eligible locations):**[7]
  - **1 year IOR 9x5, 4 hr avg response** (ServicePac® part num 69P9403)
  - **2 year IOR 24x7, 4 hr avg response** (ServicePac part num 96P2123)
  - **2 year IOR 24x7, 2 hr avg response** (ServicePac part num 96P2124)
  - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 21P2078)
  - **3 year IOR 9x5, NBD response** (ServicePac part num 69P9258)
- ↪ **Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf**
- ↪ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

IBM® Type-model	Qty x Processor	Speed/Core	L2 cache	Watts	CPU/Memory cards	Memory	DIMM slots	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8877-1RY	1 x Opteron™ 8212	2.0GHz/DC	2MB	95W	One	2x512MB	8	SAS	4U⁴ rack	7x5	1 x 1500W	3	Sep 2006
8877-2RY	1 x Opteron 8214	2.2GHz/DC	2MB	95W	One	2x512MB	8	SAS	4U rack	7x5	1 x 1500W	3	Sep 2006
8877-4RY	2 x Opteron 8218	2.6GHz/DC	2MB	95W	Two	4x1GB	16	SAS	4U rack	7x5	1 x 1500W	3	Sep 2006
8877-5RY	2 x Opteron 8220 SE	2.8GHz/DC	2MB	120W	Two	4x1GB	16	SAS	4U rack	7x5	1 x 1500W	3	Sep 2006

Positioning	***Up to 4-way, high performance server with maximum memory availability and superior performance per watt***
Processors	One AMD® Opteron 8000 Series Dual Core Processor up to 2.8GHz[1] / simultaneously supports 32-bit and 64-bit computing
L2 cache	**1MB** / per core / at processor speed
Processor upgrade	**4-way SMP** / up to four Opteron Processors (same speed/cache size) / Dual Core Capable
Implementation	System board contains four CPU/Memory Card Connectors, one HTx slot, four PCI-Express slots, two PCI-X slots, one dedicated slot for optional RSA II daughter card and integrated SAS, dual ethernet, graphics

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

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

Chipset	**ServerWorks**™ **Chipset** / Two HT2100 PCI-Express Host Bridges / **HT2100A** provides: one PCI-Express x8 slot, one PCI-Express x4 slot, PCI-Express bridge to Adaptec SAS, PCI-Express bridge to Dual GB ethernet and HyperTransport bridge to HT1000 South Bridge / **HT2100B** provides: one PCI-Express x16 slot and one PCI-Express x8 slot / **HT1000 South Bridge** provides: two PCI-X 1.0 slots at up to 64-bit/133MHz, USB(2.0), ATI video, IDE and LPC bus to NS PC87427 for Super I/O
Bus Slots	(See below) Four total PCI-Express / two PCI-X at up to133 MHz / one HTx / one dedicated slot for optional RSA II daughter card

DVD-ROM / diskette	8X[6] Slim DVD-ROM / none
Ethernet	Dual Broadcom® 5708C 10/100/1000 ethernet controllers / on systemboard / two full gigabit ethernet MAC and PHY layer functions / PCI-Express / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear
Graphics controller	XVGA / ATI® RN50(ES1000) / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* RSA ethernet, RSA serial, one USB(2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial RS-485 / *Front:* two USB(2.0)

Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems mgmt	BMC standard / IPMI 2.0 / **PowerExecutive**™ / **Remote Supervisor Adapter II Slimline** optional / PCI adapter / includes 10/100 ethernet and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide**™ (CD-ROM installation and configuration utilities), IBM Director

Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* one 1500 watt hot-swap(240 VAC); *Max:* two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA
Cooling fans	**Calibrated Vectored Cooling**™ *Std:* three fans; *Max:* six / hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and management processor / redundant fan kit required for three or more processors

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

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

DVD-ROM

- ② Opt disk
- ③ Opt disk
- ④ Opt disk
- ⑤ Opt disk
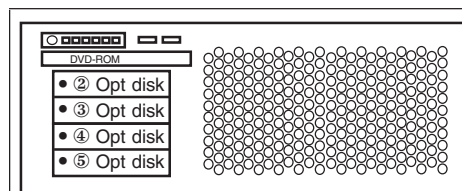
Max BTU Output:
Ship Config:409 Btu/hr (120 watts)
Full Config:1366 Btu/hr (400 watts)

Bay ① 5.25", 0.5", access, std DVD-ROM
Bay ② 3.5", SL 1", access, hot-swap, open
Bay ③ 3.5", SL 1", access, hot-swap, open
Bay ④ 3.5", SL 1", access, hot-swap, open
Bay ⑤ 3.5", SL 1", access, hot-swap, open

Available expansion slots:

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

⇨ Dimensions: H7" x W19" x D28"
    Dimensions: H178mm x W483mm x D711mm
⇨ Weight: 26 to 32lbs; 11.8 to 14.6kg
⇨ Stealth black color
⇨ Tool-free serviceability
⇨ Access adapters, power supplies, processors, memory and systemboard from top
⇨ Setup Program by pressing F1 at startup
⇨ Diagnostics (PC-Doctor) by pressing F2 at startup
⇨ Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
⇨ Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
⇨ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

All models: Maximum internal disk capacity: 1.2TB with four 300GB[2] hot-swap SAS disks

LIMITED WARRANTY[3]

↪ **3 year parts and labor**
↪ **International Warranty Service**[3]
↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
↪ **On site service upgrade options (in eligible locations):**[7]
  • **3 year IOR 24x7, 4 hr avg response** 69P9507
  • **3 year IOR 24x7, 2 hr avg response** 69P9508
  • **1 year IOR 9x5, NBD response** 69P9398
  • **2 year IOR 9x5, NBD response** 96P2117
↪ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
↪ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information   • = Hot-swap   (x3755A) © IBM Corp. August 2006

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory Cards	Disks	Disk Controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8865-13U	1 x Xeon™ MP 3.16GHz	SC	1MB	1GB(2x512MB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-1TU	1 x Xeon MP 3.16GHz	SC	1MB	1GB(2x512MB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006
8865-22U	1 x Xeon MP 3.66GHz	SC	1MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-2TU	1 x Xeon MP 3.66GHz	SC	1MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006
8865-32U	1 x Xeon MP 7020 2.67GHz	DC	2MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-3TU	1 x Xeon MP 7020 2.67GHz	DC	2MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006
8865-42U	1 x Xeon MP 7040 3.0GHz	DC	4MB	2GB(2x1GB)	4	One	None	SAS	Tower	6x12	2 x775W	3	May 2006
8865-4TU	1 x Xeon MP 7040 3.0GHz	DC	4MB	2GB(2x1GB)	4	One	None	SAS	7U Rack	6x12	2 x775W	3	May 2006

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

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

LIMITED WARRANTY[3]

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

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

7U[4] **Rack or Tower**

Light Path Diag
Removable Processor Board Tray
Opt disk / Opt disk / Floppy Drive
Opt disk / Opt disk / CD-ROM
Opt disk / Opt disk
Opt disk / Opt disk / Full High Tape Bay
Opt disk / Opt disk
Opt disk / Opt disk / or 2 Half High Bays

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

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

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

See footnotes for important warranty information   • = Hot-swap

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

Processors — Up to two 64-bit Intel® Xeon™ Processor MP up to 3.30GHz[1] 667MHz FSB Dual Core / one 64-bit Intel Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) / Hyper-Threading

L2 cache — 1MB / per core / on die of processor / at processor speed / XceL4v™ Dynamic Server Cache

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

Processor upgrade — 4-way SMP / up to four Xeon Processors MP (same speed/cache size)

Implementation — System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, four Active™ PCI-E x8 slots, two Active™ PCI-X 2.0 slots, integrated Serial Attach SCSI (SAS), ethernet, and graphics

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

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

SAS connectors — Dual-channel controller wired to dual SAS backplanes

SAS cabling — Hot-swap bays connect to integrated SAS controller through SAS expander, 1 cable for each of the 2 SAS backplanes

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

Disk - capacity — Max: 3.6TB-10k / supports up to 15,000 rpm disks

Disk - bays — Up to Twelve 3.5" hot-swap bays / Six standard converged tray / 80-pin SCA-2 connectors / One FH (or 2 HH) Tape Drive Bays

Mechanical — EIA 19" rack models (7U[4]) x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)

Chipset — IBM XA-64e™ 3rd Generation chipset / Integrated Processor and Memory Controller / Supports EM64T / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse], Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-E x8 slots

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

DVD-ROM / diskette — IBM SlimLine DVD-ROM, IDE (ATAPI), 1.6" HH, bootable / 3.5" 1.44 MB diskette drive

Ethernet — Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2

Graphics controller — SVGA / ATI® Radeon Mobility 7000 / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

Ports — Rear: RSA ethernet, RSA serial, two USB(2.0), kybd, mouse, DB-15 graphics, two ethernet, std. serial, RS-485 / Front: USB (2.0)

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

Systems management — BMC standard / IPMI 2.0 / Remote Supervisor Adapter II slimline (std on 41U & 4RU) / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies / optional on others

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

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

Keyboard / mouse — Rack model: none standard / Tower model: IBM 104-key keyboard (PS/2) / IBM 3-button optical mouse (PS/2)

Power supplies — Some: two; some: three / 775 watt hot-swap / redundant with three power supplies (N+1) / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA

Cooling fans — Eight hot-swap, redundant, multi-speed fans / One cooling fan in each power supply filler when power supply is not installed / PFA / failure signals Diagnostic LED and mgmt processor

Options

1GB PC2-3200 CL3 ECC RDIMM (2x512MB)	39M5821	IBM ServeRAID 8i SAS Adapter	39R8729	
2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809	IBM ServeRAID 6M U320 256MB Adapter	39R8816	
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812	IBM 73.4GB 10K 3.5" SAS Hot-swap HDD	40K1039	
Active Memory 4-slot Expansion Card	41Y5000	IBM 146GB 10K 3.5" SAS Hot-Swap HDD	40K1040	
Xeon 7110N 2.5GHz/4MB L3/Dual Core Proc	40K1259	IBM 300GB 10K 3.5" SAS Hot-swap HDD	40K1041	
Xeon 7120N 3.0GHz/4MB L3/Dual Core Proc	40K1260	Remote Supervisor Adapter II Slimline	39Y9566	
Xeon 7130N 3.16GHz/8MB L3/Dual Core Proc	40K1261	SAS 3.5" 6-drive Backplane	41Y5003	
Xeon 7140N 3.3GHz/16MB L3/Dual Core Proc	40K1262	IBM 73.4GB 15K 3.5" SAS Hot-swap HDD	40K1043	
775 watt Hot-Swap Power Supply (WW)	41Y5002	IBM 146GB 15K 3.5" SAS Hot-swap HDD	40K1044	

LIMITED WARRANTY[3]
- 3 year parts and labor
- International Warranty Service[3]
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time[7]
- On site service upgrade options (in eligible locations):[7]
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9187)
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 31L2723)
  - 4 year IOR 9x5, NBD response (ServicePac part num 69P9218)
  - 5 year IOR 9x5, NBD response (ServicePac part num 69P9222)
- Other ServicePac options at http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf
- 24x7[14] toll-free support for warranty issues during the warranty period[3]

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

7U[4] Rack or Tower — Light Path Diag / Removable Processor Board Tray / Opt disk (×12) / Floppy Drive / CD-ROM / Full High Tape Bay or 2 Half High Bays

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

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

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

See footnotes for important warranty information   • = Hot-swap   (X3800B) © IBM Corp. Sep 2006

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	Disks	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8863-1SY	1 x Xeon™ MP 3.16GHz	SC	1MB	2x1GB	4	One	None	SAS	3U⁴ rack	6x7	1 x 1300	3	May 2006
8863-2SY	1 x Xeon MP 3.66GHz	SC	1MB	2x1GB	4	One	None	SAS	3U rack	6x7	1 x 1300	3	May 2006
8863-3SY	1 x Xeon 7020 MP 2.67GHz	DC	2x1MB	2x1GB	4	One	None	SAS	3U rack	6x7	1 x 1300	3	May 2006
8863-4SY	1 x Xeon 7040 MP 3.0GHz	DC	2x2MB	2x1GB	4	One	None	SAS	3U rack	6x7	1 x 1300	3	May 2006
8863-E8Y	2 x Xeon MP 3.66GHz	SC	1MB	2x1GB	4	One	None	SAS	3U rack	6x7	2 x 1300	3	May 2006
8863-E9Y	1 x Xeon MP 3.16GHz	SC	1MB	2x1GB	4	One	None	SAS	3U rack	6x7	2 x 1300	3	May 2006
8863-EAY	4 x Xeon 7020 MP 2.67GHz	DC	2x1MB	8x1GB	16	Four	None	SAS	3U rack	6x7	2 x 1300	3	May 2006

Processors	**Up to two 64-bit Intel® Xeon™ Processor MP up to 3.66GHz¹ 667MHz FSB Single Core / Up to four 64-bit Intel Xeon Processor MP up to 3.0GHz 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading
L2 cache	**1 or 2 MB** / per core / at processor speed / **XceL4v™** Dynamic Server Cache
Processor upgrade	**4-way SMP** / up to four Xeon Processors MP (same speed/cache size) / Dual Core Capable
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, six Active™ PCI-X 2.0 slots, and integrated SCSI, ethernet, graphics
Active Memory™	**2GB** std / 64GB max per chassis using high-capacity memory card / one memory card standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™
SAS disk controller	*Some*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / ServeRaid 8i *std on E8Y & EAY* / optional on others
SAS connectors	Dual channel controller wired to SAS backplane
SAS cabling	Two standard SAS cables attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	Supports up to 73GB 10K rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse], Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots support up to 266MHz
DVD-ROM / diskette	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	BMC standard / IPMI 2.0 / **Remote Supervisor Adapter II Slimline** *std on E8Y & EAY* / optional on others / PCI adapter / includes 10/100 ethernet and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director

Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* one 1300 watt hot-swap (240 VAC); *Max:* two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	41Y5000
Xeon MP 3.16GHz/1MB L2 Cache Proc Upg	40K2521
Xeon MP 3.66GHz/1MB L2 Cache Proc Upg	40K2520
Xeon MP 7020 2.67GHz/2x1MB L2 Cache Proc Upg	40K2522
Xeon MP 7040 3.0GHz/2x2MB L2 Cache Proc Upg	40K2523
1300 watt Hot-Swap Power Supply (WW)	41Y5001
IBM ServeRAID-8i SAS-SCSI Adapter	39R8729
IBM ServeRAID 6M U320 256MB Adapter	02R0988
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	40K1051
IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	40K1052
IBM Remote Supervisor Adapter II Slimline	39Y5566
Dual Core X3 upgrade kit	41Y5005
Other options at **ibm.com**/pc/us/accessories	

Six available 3.3 volt PCI-X 2.0 slots:

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

•Opt disk	•Opt disk	•Opt disk
•Opt disk	•Opt disk	•Opt disk

DVD-ROM

Light Path Diag

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: 1,086 Btu/hr (318 watts)
Full Configuration: 5,200 Btu/hr (1524 watts)

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

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

LIMITED WARRANTY³

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

See footnotes for important warranty information   • = Hot-swap

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	RSA II	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8864-1RU	1 x Xeon™ MP 7110N 2.5GHz	DC	2x1MB	2x1GB	4	One	Opt	SAS	3U⁴ rack	6x7	1 x 1300	3	Oct 2006
8864-2RU	2 x Xeon MP 7120N 3.0GHz	DC	2x1MB	2x1GB	4	One	Std	SAS	3U rack	6x7	1 x 1300	3	Oct 2006
8864-3RU	2 x Xeon MP 7130N 3.16GHz	DC	2x1MB	2x1GB	4	One	Std	SAS	3U rack	6x7	1 x 1300	3	Oct 2006
8864-4RU	2 x Xeon MP 7140N 3.3GHz	DC	2x1MB	2x2GB	8	Two	Std	SAS	3U rack	6x7	2 x 1300	3	Oct 2006

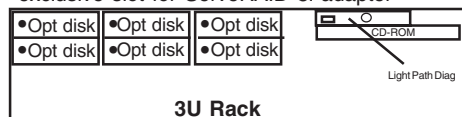|	
Processors	**Up to two 64-bit Intel® Xeon™ Processor MP up to 3.3GHz**[1] **667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T) /** Hyper-Threading
L2 cache	**1 MB** / per core / at processor speed / **XceL4v™** Dynamic Server Cache
L3 cache	4MB on 7110N & 7120N / 8MB on 7130N / 16MB on 7140N
Processor upgrade	**4-way SMP /** up to four Xeon Processors MP (same speed/cache size) / Dual Core Capable
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, four Active™ PCI-E x8 slots, two Active™ PCI-X 2.0 slots and integrated SCSI, ethernet, graphics
Active Memory™	**2 or 4GB** std / 64GB max per chassis using high-capacity memory card / one memory card standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™ / Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™
SAS disk controller	*Some*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 *Some*: **ServeRAID™ 8i / RAID 0,1, 10, 5, 6, 60, 1E & 5EE** / std on *4RU* / dedicated slot / 64-bit 133MHz PCI-X
SAS connectors	Dual channel controller wired to SAS backplane
SAS cabling	Two standard SAS cables attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	Supports up to 73GB 10K rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER)
Chipset	**IBM XA-64e™ 3rd Generation chipset /** Integrated Processor and Memory Controller / Supports EM64T / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-E x8 slots
Slots (Active™)	Four Active™ PCI-E x8 slots / full height, full length / Two Active™ PCI-X 2.0 64-bit slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers
DVD-ROM / diskette	8X⁶ Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000m / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* RSA ethernet, RSA serial, two USB (2.0), kybd, mouse, DB-15 graphics, two ethernet, std. serial RS-485 / *Front:* USB (2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
System management	BMC standard / IPMI 2.0 / **PowerExecutive™ / Remote Supervisor Adapter II Slimline** std on *2RU, 3RU & 4RU /* optional on *1RU* / PCI adapter / includes 10/100 ethernet and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director

Keyboard / mouse	None standard (because rack-based)	
Power supplies	*Some:* one; *some:* two / 1300 watt hot-swap(240 VAC); *Max:* two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA	
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor	

Option	Part #
2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	41Y5000
Xeon 7110N 2.5GHz/4MB L3/Dual Core Proc	40K1259
Xeon 7120N 3.0GHz/4MB L3/Dual Core Proc	40K1260
Xeon 7130N 3.16GHz/8MB L3/Dual Core Proc	40K1261
Xeon 7140N 3.3GHz/16MB L3/Dual Core Proc	40K1262
1300 watt Hot-Swap Power Supply (WW)	41Y5001
IBM ServeRAID™-8i SAS Adapter	39R8729
IBM ServeRAID 6M U320 256MB Adapter	39R8816
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	40K1051
IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	40K1052
IBM Remote Supervisor Adapter II Slimline	39Y9566

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

Two available 3.3 volt PCI-X 2.0 slots:
Slot 1 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Slot 2 - fullsize, 64-bit, 266MHzPCI-X, hot-swap
Four available PCI-E x8 slots:
Slot 3 - full-height, full-length, PCI-E x8
Slot 4 - full-height, full-length, PCI-E x8
Slot 5 - full-height, full-length, PCI-E x8
Slot 6 - full-height, full-length, PCI-E x8
*exclusive slot available for ServeRAID 8i adapter

•Opt disk	•Opt disk	•Opt disk	
•Opt disk	•Opt disk	•Opt disk	DVD-ROM

Light Path Diag

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: 1,086 Btu/hr (318 watts)
Full Configuration: 5,200 Btu/hr (1524 watts)

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

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

LIMITED WARRANTY[3]

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

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	Disks	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8872-7RY	2 x Xeon™ MP 7020 2.66GHz	DC	2x1MB	2x1GB	8	Two	None	SAS	3U⁴ rack	6x7	2 x 1300	3	May 2006
8872-8RY	2 x Xeon MP 7040 3.0GHz	DC	2x2MB	2x1GB	8	Two	None	SAS	3U rack	6x7	2 x 1300	3	May 2006

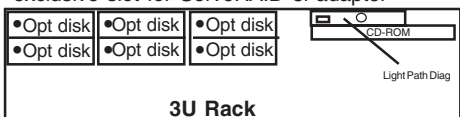|	
Processors	**Two 64-bit Intel® Xeon™ Processor MP up to 3.0GHz**[1] **667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading technology
L2 cache	**1 or 2MB** / per core / XceL4v™ Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache	None
Processor upgrade	**4-way SMP** / up to four Xeon Processors (same speed/cache/core) per chassis / Dual Core Capable / up to **32-way** (eight chassis interconnected)
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, six Active™ PCI-X 2.0 slots, and integrated Serial Attached SCSI, ethernet, graphics
Active Memory™	**2GB** std / 64GB max per chassis using high-capacity memory card / 512GB max (eight chassis interconnect) / two memory cards standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)
SAS disk controller	*ALL*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / ServeRaid 8i optional with dedicated slot
SAS connectors	Dual channel controller wired to SAS backplane
SAS cabling	Two standard SAS cables attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	*None* / supports up to 73GB 10,000 rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER) / connect eight chassis (x3950 or x3950 E) to achieve 32-way in 24U
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / Support for external scalability and memory control / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots support up to 266MHz
DVD-ROM / diskette	8X⁶ Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet per chassis / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000M / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* Three Scalability ports, RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial RS-485 / *Front:* One USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
Systems management	**Remote Supervisor Adapter II slimline** / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies / BMC / IMPI 2.0 /
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director)
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* Two 1300 watt hot-swap(240 VAC); *Max:* two hot-swap / fully redundant with two power supplies /worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

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

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

8W = 2 x XpandOnDemand Scalabilty kits 2.3m

16W = 6 x XpandOnDemand Scalabilty kits 2.3m

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

Six available 3.3 volt PCI-X 2.0 slots:

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

•Opt disk	•Opt disk	•Opt disk
•Opt disk	•Opt disk	•Opt disk

CD-ROM

Light Path Diag

3U Rack

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

Max BTU Output:
Ship Configuration: 1,325 Btu/hr (388 watts)
Full Configuration: 5,200 Btu/hr (1524 watts)

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

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

LIMITED WARRANTY[3]

⇨ **3 year parts and labor**
⇨ **International Warranty Service**[3]
⇨ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
⇨ **On site service upgrade options (in eligible locations):**[7]
  • **3 year IOR 24x7, 4 hr avg response** 96P2688
  • **3 year IOR 24x7, 2 hr avg response** 96P2689
  • **4 year IOR 9x5, NBD response** 96P2690
  • **5 year IOR 9x5, NBD response** 96P2694
⇨ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
⇨ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information   • = Hot-swap

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	Disks	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
8878-1RY	2 x Xeon™ MP 7110N 2.5GHz	DC	2x1MB	2x1GB	8	Two	None	SAS	3U⁴ rack	6x7	2 x 1300	3	Nov 2006
8878-2RY	2 x Xeon MP 7120N 3.0GHz	DC	2x1MB	2x2GB	8	Two	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2006
8878-3RY	2 x Xeon MP 7130N 3.16GHz	DC	2x1MB	2x2GB	8	Two	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2006
8878-4RY	2 x Xeon MP 7140N 3.3GHz	DC	2x1MB	2x2GB	16	Four	None	SAS	3U rack	6x7	2 x 1300	3	Nov 2006

Processors	**Two 64-bit Intel® Xeon™ Processor MP up to 3.0GHz[1] 667MHz FSB Dual Core / NetBurst™ / Extended Memory 64 Technology™ (EM64T)** / Hyper-Threading technology
L2 cache	**1MB** / per core / XceL4v™ Dynamic Server Cache (256MB per 4 CPUs starting at 8-way)
L3 cache	4MB on 7110N & 7120N / 8MB on 7130N / 16MB on 7140N
Processor upgrade	**4-way SMP** / up to four Xeon Processors (same speed/cache/core) per chassis / Dual Core Capable / up to **32-way** (eight chassis interconnected)
Implementation	System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, six Active™ PCI-X 2.0 slots, and integrated Serial Attached SCSI, ethernet, graphics
Active Memory™	**2GB** std / 64GB max per chassis using high-capacity memory card / 512GB max (eight chassis interconnect) / two memory cards standard (up to four) with 4 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-3200 400MHz registered 240-pin DDR2-SDRAM RDIMMs / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill™** / **Memory ProteXion™** (redundant bit steering) and **Memory Mirroring™** and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)
SAS disk controller	*ALL*: Adaptec® AIC-9410 / **Serial Attached SCSI (SAS)** 3.0GHz (3GB/sec) / 64-bit 266MHz PCI-X 2.0 / **ServeRAID™ 8i** / **RAID 0,1, 10, 5, 6, 60, 1E & 5EE** / standard on *2RY, 3RY & 4RY* / dedicated slot / 64-bit 133MHz PCI-X / optional on others
SAS connectors	Dual channel controller wired to SAS backplane
SAS cabling	Two standard SAS cables attached to six-bay backplane
IDE controller / cabling	Enhanced IDE ATA-33 controller in CSB6 South Bridge
Disk - capacity	*None* / supports up to 73GB 10,000 rpm disks
Disk - bays	**Six** 2.5" hot-swap bays / converged tray / 80-pin SCA-2 connectors
Mechanical	**EIA 19" rack models (3U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 SR, NetBAY42 ER) / connect eight chassis (x3950 or x3950 E) to achieve 32-way in 24U
Chipset	**IBM XA-64e™ 3rd Generation chipset** / Integrated Processor and Memory Controller / Supports EM64T / Support for external scalability and memory control / 2 IBM PCI-X 2.0 Host Bridges / Host Bridge One supports video, optional ServeRaid 8i, ServerWorks® CSB6 South Bridge (IDE, USB, bus for Super I/O NS 87417 [diskette, keyboard, mouse]), Dual Port Broadcom 5704, and 2 PCI-X 2.0 slots / Host Bridge Two supports 4 PCI-X 2.0 slots
Slots (Active™)	Six total PCI-X 2.0 slots available with power and attention indicator lights (optical sensors control power to slot) / hot replace, hot upgrade, hot expansion / separated by insulative plastic dividers, all slots support up to 266MHz
DVD-ROM / diskette	8X⁶ Slim DVD-ROM / none
Ethernet	Broadcom® 5704 10/100/1000 dual ethernet per chassis / on systemboard / 64-bit 266Mhz PCI-X 2.0 / Wake on LAN® / Alert on LAN™ 2
Graphics controller	SVGA / ATI® 7000M / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Ports	*Rear:* Three Scalability ports, RSA ethernet, RSA serial, two USB (Ver 2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial RS-485 / *Front:* One USB (Ver 2.0)
Security	Power-on and administrator passwords / unattended boot / selectable boot
System management	**Remote Supervisor Adapter II slimline** / PCI adapter / includes 10/100 ethernet, RJ-11, and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies / BMC / IMPI 2.0 / **PowerExecutive™**
Diagnostics	**Drop down Light Path Diagnostics** / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director)
Software	**ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based)
Power supplies	*Std:* Two 1300 watt hot-swap(240 VAC); *Max:* two hot-swap / fully redundant with two power supplies / worldwide / voltage-sensing / auto-restart / rear accessible fans in each power supply / PFA
Cooling fans	Eight hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor

2GB PC2-3200 CL3 ECC RDIMM (2x1GB)	39M5809
4GB PC2-3200 CL3 ECC RDIMM (2x2GB)	39M5812
8GB PC2-3200 CL3 ECC RDIMM (2x4GB)	30R5145
Active Memory 4-slot Expansion Card	41Y5000
Xeon 7110N 2.5GHz/4MB L3/Dual Core Proc	40K1259
Xeon 7120N 3.0GHz/4MB L3/Dual Core Proc	40K1260
Xeon 7130N 3.16GHz/8MB L3/Dual Core Proc	40K1261
Xeon 7140N 3.3GHz/16MB L3/Dual Core Proc	40K1262
IBM ServeRAID™-8i Adapter	39R8729
IBM ServeRAID 6M U320 256MB Adapter	39R8816
IBM 36.4GB 10K 2.5" SAS Hot-swap HDD	40K1051
IBM 73.4GB 10K 2.5" SAS Hot-Swap HDD	40K1052
XpandOnDemand™ Scalability Cable - 2.3M	13M7414
XpandOnDemand™ Scalability Cable - 2.9M	13M7416
x3950 Scalability Enablement Memory Adapter	41Y5004
x3950 E Modular Expansion Enclosure	8874-3RY
Dual Core X3 upgrade kit	41Y5005
Other options at **ibm.com**/pc/us/accessories	

8W = 2 x XpandOnDemand Scalabilty kits 2.3m

16W = 6 x XpandOnDemand Scalabilty kits 2.3m

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

Six available 3.3 volt PCI-X 2.0 slots:

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

•Opt disk •Opt disk •Opt disk
•Opt disk •Opt disk •Opt disk

CD-ROM

Light Path Diag

3U Rack

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

Max BTU Output:
Ship Configuration: 1,325 Btu/hr (388 watts)
Full Configuration: 5,200 Btu/hr (1524 watts)

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

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

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8677-3XX	HS20/HS40/JS20/JS21/LS20	0 / 14	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2000W	2 / 2	7U⁴ rack	Oct 2004
8677-3RX	HS20/HS40/JS20/JS21/LS20	0 / 14	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2000W	2 / 2	7U rack	Mar 2006

Positioning Description	***Flexible, innovative design provides investment protection and reduces deployment costs*** Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (diskette drive, optical drive, and ports for USB, keyboard, video, mouse)
Blade bays	**Supports all blades HS20/HS40/JS20/JS21/LS20** and SCSI Storage Expansion Units / 14 hot-pluggable bays / front access
Switch modules	*Std:* none; *max:* four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru
Advanced Management Module (8677-3RX only)	*Std:* one on 3RX; *max:* two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 14 blade servers
Management Module (8677-3XX only)	*Std:* one on 3XX; *max:* one or two / hot-swap / rear access / comprehensive system management functions / PowerPC® 401 controller / communicates with integrated system management processor on each server blade / multiplexor for console connectivity / ports: DB-15 analog video port, PS/2 keyboard port, PS/2 mouse port, 10/100 ethernet remote management connection port / all ports shared by up to 14 blade servers
Power modules	*Std:* two in bays 1 and 2 (two 9ft IEC 320-C13 to C14 or two IEC 320-C19 to C20 cables for intrarack power distribution); *max:* four / hot-swap / rear access / 2000 watts at 220v / both redundant to each other (N+N redundancy) / two std modules supply power to all modules and blade bays 1 through 6 / power for bays 7 through 14 requires two additional power modules in bays 3 and 4 (redundant to each other) / worldwide / voltage-sensing / auto-restart / no fans power module(s)
Blower modules	*Std:* two; *max:* two / hot-swap / redundant / variable speed / rear access / up to 325 cubic ft per min (CFM) / front to back airflow
Mechanical DVD / diskette / USB	**EIA 19" rack models (7U⁴)** x 28" deep / supported in NetBAY™ Racks (such as NetBAY42 ER, NetBAY42 SR) *3XX/3RX:* 8X-24X⁶ DVD-ROM / 3.5" 1.44MB diskette drive / one USB port (Version 1.1) / all USB interface / not removable / front access / shared by up to 14 blade servers / requests for CD-ROM, diskette drive, and USB port by pressing CD select button on server blade front panel
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions
Ports	*Rear:* keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / *Front:* one USB (Version 1.1)
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures
Ethernet	One of the dual integrated gigabit ethernet controllers on each blade server connects to an optional *GB Ethernet Switch Module* (the second ethernet controller requires a second optional *GB Ethernet Switch Module*)
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software
System LED panel	System LED panel provides power-on, location, over-temperature, information, and system-error conditions

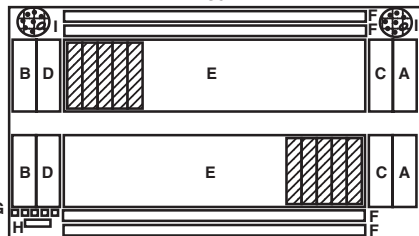|			
Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888	IBM Advanced Management Module	25R5778
Cisco Systems Gigabit Ethernet Switch Module	32R1892	IBM KVM/Redundant Management Module	48P7055
Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module	32R1859	1U 17" Flat Panel Monitor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

Front

LED panel   Bay 1   Bay 2

ooooo □ ▭ | USB DVD-ROM | | USB Diskette |

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14   Blade bays

Rear

SM3 • SM1 • PM3 • | Blower module 1 • (std) | PM1 • MM1 •
SM4 • SM2 • PM4 • | Blower module 2 • (std) | PM2 • MM2 •

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

Module bays

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)

➪ 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

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Advanced Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8852-4XX	HS20/HS40/JS20/JS21/LS20	0 / 14	0 / 10	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	2900W	2 / 2	9U⁴ rack	Mar 2006

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

1U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17231UX	BladeCenter H 2900W Power Module pair with Fan Packs	31R3335
2U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17232UX	IBM Advanced Management Module	25R5778
NetBAY ACT Local Console Manager (CAT5 KVM cabling)	1735L04	BladeCenter H Double 30A NEMA L6-30P (208V) 4.3M	25R5783
NetBAY ACT Remote Console Manager (CAT5 KVM cabling)	1735R16	BladeCenter H Dual 32A IEC 309 P+N+G/16A IEC 320-C20 (230V) 4.3M	25R5784
NetBAY ACT 250mm KVM Conversion Option	32P1636	BladeCenter H Triple 16A IEC 320-C20 (200-240V) 2.8M	25R5785
NetBAY ACT 1.5m KVM Conversion Option	32P1652	BladeCenter H Double 30A KSC 8305 (220V) 4.3M (Korea)	25R5811
Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888	BladeCenter H Dual 32A AS/NZS 3112/16A IEC320-C20 (ANZ)	25R5812
Cisco Systems Gigabit Ethernet Switch Module	32R1892	BladeCenter H Serial Port Breakout Cable	25R5806
Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module	32R1859	IBM BladeCenter 4-port GB Ethernet Switch Module	48P7054
Brocade 10 port 4Gb SAN Switch Module	32R1813	IBM BladeCenter 2-port Fibre Channel Switch Module	48P7062
Brocade 20 port 4Gb SAN Switch Module	32R1812		
Cisco Systems InfiniBand Switch Module for BladeCenter	32R1900	• Other options at **ibm.com**/products/us	
NetBAY42 Enterprise Rack Cabinet	930842S	• Solutions available from IBM BladeCenter Alliance program partners	

Front

- Power Module 1
- Power Module 3
- Server Blade 1–14
- Media Tray
- Power Module 2
- Power Module 4
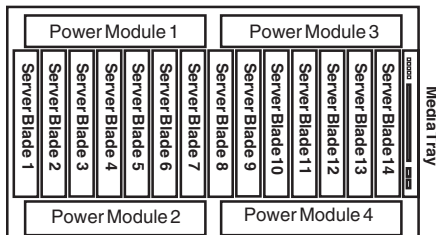
➪ Dimensions: H15.75" x W19" x D29"
➪ Dimensions: H400.05mm x W482.6mm x D766.6mm
➪ Weight: 90 to 350 lb; 40.82 to 158.8kg
➪ Stealth black color bezel
➪ Tool-free customer serviceability
➪ Access server blades, expansion units and power modules from front
➪ Access modules from rear
➪ Midplane in center of system to interface for all system components
➪ Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

Rear

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

See footnotes for important warranty information

IBM BladeCenter® HS20 (8843)

IBM® Type-model	Processor GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	SCSI Support with optional stor exp unit	slots x bays	Mech- anical	Ethernet	Available date
8843-L1y-L1x	1 x Xeon™ 2.8LV	1MB	800	512MB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Feb 2005
8843-J1y-J1x	1 x Xeon 2.8LV	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Feb 2005
8843-M5y-M5x	1 x Xeon 3.0LV	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Feb 2005
8843-25y-25x	1 x Xeon 3.2	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2005
8843-E2y-E2x	1 x Xeon 3.2	2MB	800	2GB	36GB	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2005
8843-35y-35x	1 x Xeon 3.4	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2005
8843-45y-45x	1 x Xeon 3.6	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2005
8843-25y-25x	1 x Xeon 3.2	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2005
8843-05y-05x	1 x Xeon 2.8	2MB	800	1GB	36GB	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Sep 2005
8843-55y-55x	1 x Xeon 3.8	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Sep 2005
8843-E7y-E7x	1 x Xeon 2.8	2MB	800	512MB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Sep 2005
8843-E9y-E9x	2 x Xeon 3.8	2x2MB	800	4GB	None	Ultra320	2-fixed	2 Hot-swap Ultra320	0 x 2	7U blade	2 x Gigabit	Sep 2005

Processor(s)	**1 or 2 x Intel® Xeon up to 3.8GHz with 800MHz frontside bus (FSB)** / **EM64T** / **1-2MB L2 ECC Cache** / Hyper-Threading technology / *L1U, J1U and M5U:* Features **Low Volage Processor** for reduced heat ouput allowing greater rack population
SMP - L2 Cache Implementation	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **1 or 2MB** std and **4MB** max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet
Memory	**512MB/1GB** std / **16GB**[13] max / two slots used / two slots available / **PC2-3200** 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Chipkill™
SCSI disk controller	**LSI Logic® 53C1020** SCSI controller / **Single channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports **RAID-1 & 1E mirroring** / One 16-bit channel (one internal) / *Internal channel:* one 2-drop 16-bit 68-pin LVD SCSI cable
SCSI Disk bays	**Two 2.5-inch Small Form Factor (SFF)** Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; **all SCSI bays Ultra320-enabled**) /
External Storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical Architecture/Chipset	7U[4] Blade / Supported in IBM BladeCenter 8677-3XX or 8677-1XX/2XX (requires upgrade to 2000W power supply option 26K4816) **Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet	**Dual** gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network Interface	**One connector for I/O expansion option** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / Diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector

Systems Mgmt	**IBM Baseboard Management Controller (BMC)** / H8S2168 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module	Xeon 2.8 GHz/800/2MB L2 Cache EM64T Proc Upg — 25R8878
		Xeon 3.0 GHz/800/2MB L2 Cache EM64T Proc Upg — 25R8877
		Xeon 3.2 GHz/800/2MB L2 Cache EM64T Proc Upg — 25R8876
		Xeon 3.4 GHz/800/2MB L2 Cache EM64T Proc Upg — 13N0660
Diagnostics	**Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	Xeon 3.6 GHz/800/2MB L2 Cache EM64T Proc Upg — 13N0696
		Xeon 3.8 GHz/800/2MB L2 Cache EM64T Proc Upg — 13N0697
		512MB (2x256) PC2-3200 ECC DDR2 — 73P3523
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	1GB (2x512) PC2-3200 CL3 ECC DDR2 — 39M5818
		2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit — 39M5809
		4GB (2x2GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit — 39M5812
		8GB (2x4GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit — 30R5145
Software ship group	Documentation CD, Broadcom CD	IBM 36.4GB 10K Ultra320 SCSI 2.5" SFF NHS HDD — 40K1037
		IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD — 40K1038
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel	BladeCenter SCSI Storage Exp Unit — 26K4817
		BladeCenter SFF Fibre Channel Exp Card — 26K4841
Power supply(s)	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720)	BladeCenter SFF Gigabit Ethernet Exp Card — 26K4842
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system	Other options at **ibm.com**/pc/us/accessories

Server blade (side view)

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

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

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

Maximum internal disk capacity for each HS20 blade server[13]: 146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 300GB for total of 746GB)

See footnotes for important warranty information

IBM BladeCenter® HS20 (8843)

IBM® Type-model	Processor	GHz[1]	L2 cache	FSB MHz	Memory	Disk	Disk controller	Disk bays	SCSI Support with optional stor	exp unit	slots x bays	Mech-anical	Ethernet	Available date
8843-0Ry-0Rx	1 x Xeon™	2.8	2MB	800	1GB	36GB	Ultra320	2-fixed	2 Hot-swap	Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2006
8843-2Ry-2Rx	1 x Xeon	3.2	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap	Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2006
8843-3Ry-3Rx	1 x Xeon	3.4	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap	Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2006
8843-4Ry-4Rx	1 x Xeon	3.6	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap	Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2006
8843-5Ry-5Rx	1 x Xeon	3.8	2MB	800	1GB	None	Ultra320	2-fixed	2 Hot-swap	Ultra320	0 x 2	7U blade	2 x Gigabit	Mar 2006

Processor(s)	**1 or 2 x Intel® Xeon up to 3.8GHz with 800MHz frontside bus (FSB)** / **EM64T** / **1-2MB L2 ECC Cache** / Hyper-Threading technology / **L1U, J1U and M5U:** Features **Low Volage Processor** for reduced heat ouput allowing greater rack population
SMP - L2 Cache Implementation	**2-way SMP** / up to two Xeon Processors (same speed/cache size) / **2MB** std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet
Memory	**512MB/1GB** std / **16GB[13]** max / two slots used / two slots available / **PC2-3200** 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual-channel / Chipkill™
SCSI disk controller	**LSI Logic® 53C1020** SCSI controller / **Single channel Ultra320 SCSI controller** (LVD 320MB/sec) / on planar / 64-bit 100MHz PCI-X / supports **RAID-1 & 1E mirroring** / One 16-bit channel (one internal) / *Internal channel:* one 2-drop 16-bit 68-pin LVD SCSI cable
SCSI Disk bays	**Two 2.5-inch Small Form Factor (SFF)** Ultra320 internal fixed disk bays / Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit (80-pin SCA-2 connectors; **all SCSI bays Ultra320-enabled**) /
External Storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical Architecture/Chipset	7U[4] Blade / Supported in IBM BladeCenter 8677-3XX or 8677-1XX/2XX (requires upgrade to 2000W power supply option 26K4816) / **Intel E7520 chipset** / E7525 MCH (Memory Controller Hub) for PCI-Express bridge to PXH, ICH5R / PXH BUS supports PCI-X BUS / ICH5R supports USB (1.0) / LSI 1020 / Dual Broadcom 5704S / Low Pin Count Interface / NS PC87366 Super I/O off LPC interface
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet	**Dual** gigabit 10/100/1000 ethernet controller / Broadcom 5704S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 100MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network Interface	**One connector for I/O expansion option** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / Diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics controller	SVGA / ATI® Radeon™ 7000M on Planar / 16MB SDRAM std and max / 15 pin connector

Systems Mgmt	**IBM Baseboard Management Controller (BMC)** / H8S2168 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module	Xeon 2.8 GHz/800/2MB L2 Cache EM64T Proc Upg	25R8878
		Xeon 3.0 GHz/800/2MB L2 Cache EM64T Proc Upg	25R8877
		Xeon 3.2 GHz/800/2MB L2 Cache EM64T Proc Upg	25R8876
		Xeon 3.4 GHz/800/2MB L2 Cache EM64T Proc Upg	13N0660
Diagnostics	**Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	Xeon 3.6 GHz/800/2MB L2 Cache EM64T Proc Upg	13N0696
		Xeon 3.8 GHz/800/2MB L2 Cache EM64T Proc Upg	13N0697
		512MB (2x256) PC2-3200 ECC DDR2	73P3523
		1GB (2x512) PC2-3200 CL3 ECC DDR2	39M5818
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	2GB (2x1GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit	39M5809
		4GB (2x2GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit	39M5812
		8GB (2x4GB) PC2-3200 CL3 ECC DDR2 RDIMM Kit	30R5145
Software ship group	Documentation CD, Broadcom CD	IBM 36.4GB 10K Ultra320 SCSI 2.5" SFF NHS HDD	40K1037
		IBM 73GB 10K Ultra320 SCSI 2.5" SFF NHS HDD	40K1038
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel	BladeCenter SCSI Storage Exp Unit	26K4817
Power supply(s)	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720)	BladeCenter SFF Fibre Channel Exp Card	26K4841
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720, operating system	BladeCenter SFF Gigabit Ethernet Exp Card	26K4842
		Other options at **ibm.com**/pc/us/accessories	

Server blade
(side view)

SCSI expansion connector

Light Path Diagnostics buttons

opt CPU

opt SFF disk ①

opt SFF disk ②

std CPU

DIMM slot 1
DIMM slot 2
DIMM slot 3
DIMM slot 4

I/O expansion option connector

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

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

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

Maximum internal disk capacity for each HS20 blade server[13]: 146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 300GB for total of 746GB)

See footnotes for important warranty information

IBM BladeCenter® HS20 (7981)

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

Processor(s)	**1 or 2 x Dual-Core Intel® Xeon LV up to 2.0 GHz with 667 MHz frontside bus (FSB)** / **2MB L2 ECC Shared Advanced Transfer Cache Architecture** / Features **Ultra Low Voltage Processor** (31 watt) with Enhanced Intel SpeedStep® Technology for reduced power consumption and heat ouput allowing greater rack population
SMP - L2 Cache Implementation	**2-way SMP** / up to two Xeon LV Processors (same speed/cache size) / **2MB** cache std and max / at processor speed Systemboard contains two Intel 478-pin micro-FCPGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet
Memory	**1GB** std / **16GB**[13] max / two slots used / two slots available / **PC2-3200** 400MHz CL2.5 ECC DDR2-SDRAM RDIMMs / four 240 pin gold-connector slots on systemboard / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / dual-channel / Chipkill / hot-spare Memory and Memory Mirroring support
Disk controller Disk bays External Storage	**LSI Logic® 1064 SAS controller** on planar (3.0Gb/sec) / Dual Internal channels / supports **RAID-0 & 1 mirroring** **Two 2.5-inch Small Form Factor (SFF)** SAS internal fixed disk bays / 0GB Std / 146.8GB max Support for IBM TotalStorage™ solutions (including DS and NAS family of products)
Mechanical Architecture/Chipset BUS slots	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730, and 8852 **Intel E7520 chipset** / MCH (Memory Controller Hub) for high-speed memory and PCI-Express / PXH-V BUS supports PCI-E to PCI-X Bridge, dual GB Ethernet and 1 PCI-X bus segment for daughter card / ICH-S supports USB (1.0), on-blade service processor, PCI-X Bus Interface to LSI1064 and ATI Radeon 7000M / Dual Broadcom 5704S No external PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet 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 133MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM) **One connector for I/O expansion option** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
DVD / Diskette / USB Kybd / video / mouse Graphics controller	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing 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	

Dual-Core Intel Xeon Processor LV 1.67 GHz Proc Upg	25R8887
Dual-Core Intel Xeon Processor LV 2.0 GHz Proc Upg	25R8888
1GB (2x512MB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM	39M5818
2GB (2x1GB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM	39M5809
4GB (2x2GB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM	39M5812
8GB (2x4GB Kit) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM	30R5145
36GB Non hot-swap SFF 2.5" SAS HDD	26K5776
73GB Non hot-swap SFF 2.5" SAS HDD	26K5777
BladeCenter SFF Fibre Channel Exp Card	26K4841
IBM BladeCenter SFF Gigabit Ethernet Expansion Card	39R8624
IBM BladeCenter SFF Gigabit Ethernet Expansion Card	26K4842

Diagnostics	**Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

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

Software ship group	Documentation CD, Broadcom CD
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852) operating system

Server blade
(side view)

Bay ★ 2.5",6.35cm, no front access
Bay ◊ 2.5",6.35cm, no front access

opt SFF disk
opt SFF disk

opt CPU

★ ◊

I/O expansion option connector

std CPU

DIMM slot 4
DIMM slot 3
DIMM slot 2
DIMM slot 1

Light Path Diagnostics buttons

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 LV blade server[13]:
146GB with two 73GB SAS disks

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

IBM BladeCenter® HS21 (8853)

IBM® Type-model	Processor	GHz[1]	L2 cache	FSB MHz	Watts	Memory controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
8853-L1x 1 x Xeon™	5110	1.6	4MB	1067	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Aug 2006
8853-L2x 1 x Xeon	5120	1.86	4MB	1067	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Aug 2006
8853-L3x 1 x Xeon	5130	2.0	4MB	1333	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Aug 2006
8853-L4x 1 x Xeon	5140	2.33	4MB	1333	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Aug 2006
8853-L5x 1 x Xeon	5150	2.66	4MB	1333	65W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Aug 2006
8853-L6x 1 x Xeon	5160	3.0	4MB	1333	80W	1GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Aug 2006

Processor(s)
1 x Intel® Xeon up to 1.6GHz with 1067MHz FSB / 1 x Intel Xeon up to 3.0GHz with 1333MHz FSB / EM64T / 4MB L2 ECC Cache / Dual Core / Hyper-Threading technology

SMP - L2 Cache Implementation
2-way SMP / up to two Xeon Processors (same speed/cache size) / **4MB** std and max / at processor speed
Systemboard contains two Intel LGA771 sockets, four DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet

Memory
1GB std / **16GB**[13] max / two slots used / two slots available / on base blade / **PC2-5300** 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / memory sparing / Additional memory DIMMs can be added to each base HS21 with the Memory and I/O Expansion Unit, allowing up to 32GB of memory per blade

SAS disk controller
LSI Logic® **1064E** SAS controller / **two port** / 300MB/sec / on planar / 64-bit PCI-Express / supports **RAID-0 & 1 mirroring** / two 29-pin SFF SAS cables

SAS Disk bays
Two 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit

External Storage
Support for IBM TotalStorage™ solutions

Mechanical Architecture/Chipset
Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 (L6x only supported in 8852)
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O

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

Ethernet
Dual gigabit 10/100/1000 ethernet controller / Broadcom® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)

Network Interface
One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)

DVD/ diskette / USB Kybd / video / mouse
None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel
None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel

Graphics controller
SVGA / ATI® Radeon™ RN50 on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus

Systems Mgmt
IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module

Diagnostics
Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)

Security
No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Software ship group
Documentation CD, Broadcom CD, ServerGuide CD

Cooling Fans
Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel

Power supply(s)
Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)

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

Xeon 1.6GHz/1066/4MB L2 Cache EM64T Proc Upg	40K1225
Xeon 1.86GHz/1066/4MB L2 Cache EM64T Proc Upg	40K1226
Xeon 2.0GHz/1333/4MB L2 Cache EM64T Proc Upg	40K1227
Xeon 2.33GHz/1333/4MB L2 Cache EM64T Proc Upg	40K1228
Xeon 2.66GHz/1333/4MB L2 Cache EM64T Proc Upg	40K1230
Xeon 3.0GHz/1333/4MB L2 Cache EM64T Proc Upg	40K1229
1GB (2x512) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5782
2GB (2x1GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5785
4GB (2x2GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5791
8GB (2x4GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit	39M5797
IBM 36GB NHS 2.5" SFF SAS HDD	26K5776
IBM 73GB NHS 2.5" SFF SAS HDD	26K5777
BladeCenter Storage and I/O Expansion Blade	39R7563
BladeCenter Memory and I/O Expansion Blade	42C1600
BladeCenter SFF Fibre Channel Expansion Card	26K4841
BladeCenter SFF Gigabit Ethernet Expansion Card	39R8624
QLogic iSCSI Expansion Card for BladeCenter	32R1923
Cisco 4X InfiniBand Switch Module for BladeCenter	32R1756
Cisco 4X InfiniBand Expansion Card for BladeCenter	32R1760
QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter	26R0890
Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter	39Y9186
Other options at **ibm.com**/pc/us/accessories	

Server blade
(side view)

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

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

⇨ Stealth black front bezel
⇨ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
⇨ 12 lbs; 5.4kg (max configuration)
⇨ Configuration/Setup Utility: F1 at startup
⇨ Diagnostics (PC-Doctor™): F2 at startup
⇨ System Partition Boot: ALT+F1 at startup
⇨ Network Boot: F12 at startup
⇨ PXE Boot Agent Utility: Ctrl+S at startup
⇨ Blade control panel on each HS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
⇨ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

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

Maximum internal disk capacity for each HS21 blade server[13]*:*
146GB with two 73GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 584GB)
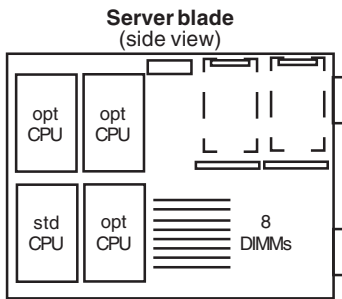
LIMITED WARRANTY[3]
⇨ **3 year parts and labor**
⇨ **International Warranty Service**[3]
⇨ **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
⇨ **On site service upgrade options (in eligible locations):**[7]
  • **4 year IOR 9x5, NBD response** (ServicePac® part num 69P9520)
  • **4 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9521)
  • **4 year IOR 24x7, 4 hr avg response** (ServicePac part num 69P9522)
  • **4 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9523)
⇨ **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
⇨ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

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

Positioning	*Ultra-dense, highly manageable modular computing platform with superior 4-way performance*
Processor(s)	**1 x Intel® Xeon 2.8GHz MP** with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture
L2/L3 cache	**512KB L2 Cache / 2MB L3 Cache** / on die of processor / at processor speed
SMP support	**4-way SMP** / up to four Xeon MP Processors (same speed/cache size)
Implementation	Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion unit connector, two I/O expansion option connectors, integrated graphics and four ethernet ports

Memory	**2GB** std / **16GB max**[13] / two slots used / six slots available / eight total slots **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed

SCSI disk controller	None / **supports optional SCSI Storage Expansion Unit** (a blade occupying adjacent blade slot / connects to HS40 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports **RAID-1 mirroring** [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)

Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**ServerWorks® Grand Champion™ 4.0 LE** / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / double slot one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)

Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional *4-port GB Ethernet Switch Module* (the second controller requires a second optional Ethernet Switch Module)
Network-interface	**Two connectors for I/O expansion option** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)

CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt	**Intel integrated Baseboard Management Controller** (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module	Xeon 2.8Ghz/2MB L3 Cache Proc Upg	13N0653
		512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
		1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
		2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	IBM HS40 SCSI Storge Expansion Unit (blade)	26K4847
		IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)	48P7061
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768
		36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD	73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel	146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728
		* Disk requires SCSI Storage Expansion Unit	
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)

opt CPU	opt CPU
std CPU	opt CPU	8 DIMMs

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

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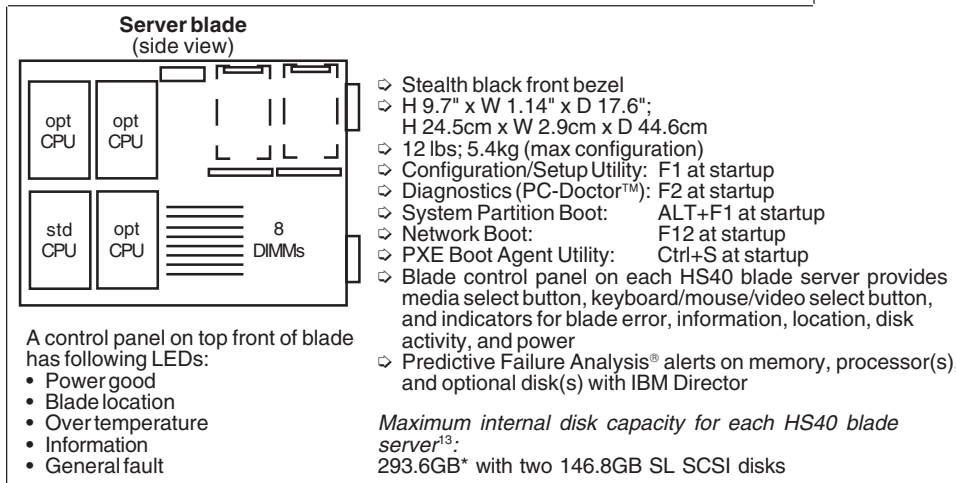➪ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

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

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

Positioning	*Ultra-dense, highly manageable modular computing platform with superior 4-way performance*
Processor(s)	**1 x Intel® Xeon MP up to 3.0GHz** with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture
L2/L3 cache	**512KB L2 Cache / Up to 4MB L3 Cache** / on die of processor / at processor speed
SMP support	**4-way SMP** / up to four Xeon MP Processors (same speed/cache size)
Implementation	Server blade contains four Intel 604-pin micro-PGA ZIF sockets, eight memory DIMM slots, one SCSI expansion unit connector, two I/O expansion option connectors, integrated graphics and four ethernet ports
Memory	**Up to 2GB** std / 16GB max[13] / *51X:* two slots used *61X/71X:* four slots used / eight total slots **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed
SCSI disk controller	None / **supports optional SCSI Storage Expansion Unit** (a blade occupying adjacent blade slot / connects to HS40 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports **RAID-1 mirroring** [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**ServerWorks® Grand Champion**™ **4.0 LE** / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) / double slot one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional *4-port GB Ethernet Switch Module* (the second controller requires a second optional Ethernet Switch Module)
Network-interface	**One connector for I/O expansion option** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon 7000 / on blade / 8MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus
Systems mgmt	**Intel integrated Baseboard Management Controller** (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD
Cooling fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system

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

* *Disk requires SCSI Storage Expansion Unit*

Server blade
(side view)

opt CPU	opt CPU
std CPU	opt CPU

8 DIMMs

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

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

Maximum internal disk capacity for each HS40 blade server[13]*:* 600GB* with two 300GB SL SCSI disks

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

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

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

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

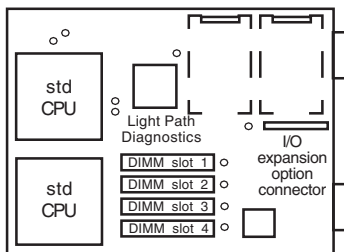|	
Xeon 2.0Ghz/1MB L3 Cache Proc Upg	13N0651
512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM	33L5038
1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5039
2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM	33L5040
IBM HS40 SCSI Storge Expansion Unit (blade)	26K4847
IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module)	48P7061
36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD*	06P5768
36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD*	06P5776
73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD*	06P5756
146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD*	32P0728

* Disk requires SCSI Storage Expansion Unit

Server blade
(side view)

opt CPU	opt CPU
std CPU	opt CPU

8 DIMMs

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

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

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

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

IBM® Type-model	Qty x Processor	GHz[1]	Core	L2 cache	Memory	Disk	Disk bays	Optional storage expansion unit	slots x bays	Mechanical	Ethernet	NEBS	Available date
8842-RTU	2 x PowerPC 970FX	2.2	SC	512KB	2GB	N/A	None	None	0 x 0	9.5mm blade	2 x Gigabit	Yes	May 2006

Positioning	**The IBM BladeCenter server for reliability in mission-critical telecommunications environments**
Processor(s)	**2 x IBM PowerPC™ 970FX** up to 2.2GHz Single-Core / 64 bit
L2 Cache	**512KB L2** Cache
SMP support	**2-way SMP** / with two PowerPC Processors (same speed/cache size)
Implementation	Server blade contains two IBM PowerPC microprocessors soldered to planar, four DIMM slots, PCI-X, EIDE controller, Fibre Channel expansion card support and dual Gigabit ethernet
Memory	**2GB** std (2x1GB) / **8GB**[13] max / two slots used / two slots available / **PC-2700** 333MHz CL2.5 ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual-channel
IDE controller	Enhanced IDE ATA-100 controller in AMD 8111 South Bridge
Disk bays	None (HDDs not supported in NEBS environment)
External Storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical	Single-wide Blade / NEBS Support in IBM BladeCenter T
Architecture/Chipset	**IBM U3 Northbridge** / **AMD 8131 HyperTransport Tunnel and PCI-X Bridge** / **AMD 8111 Southbridge** providing USB1.1 and IDE / **Broadcom 5704S** / NS PC87417 Super I/O off LPC interface
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet Controllers	**Dual Gigabit** 10/100/1000 ethernet controller / **Broadcom® 5704S** / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM)
Network Interface	One connector for I/O expansion option (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
DVD / Diskette / USB	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel
Kybd / video / mouse	None
Graphics controller	None

Systems Mgmt	**IBM Integrated Service Processor** / H82148 / IPMI 1.5 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module / Cluster System Management	1GB PC-2700 ECC CL 2.5 DDR RDIMM	39M5839
		2GB PC-2700 ECC CL 2.5 DDR RDIMM	39M5843
		IBM BladeCenter T Advanced Management Module	32R0835
		IBM BladeCenter T Chassis (AC Version)	87301RX
		IBM BladeCenter T Chassis (DC Version)	87201RX
Diagnostics	**Light Path Diagnostics** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	IBM 1300W AC Power Supply (x2)	32R0834
		IBM 1300W DC Power Supply (x2)	32R0833
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	Cisco Systems Fiber Intelligent Gigabit Ethernet Switch	26K6547
		QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter	26R0884
		BladeCenter Optical Pass-thru Module	39Y9320
Software ship group	Documentation CD, IBM Director CD, Device Driver CD	Other options at **ibm.com**/pc/us/accessories	
Cooling Fans	Uses cooling from BladeCenter T (types 8730 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel		
Power supply(s)	Uses power module(s) in BladeCenter T (types 8730 and 8720)		
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, FCC expansion card, BladeCenter T(types 8730 and 8720), operating system		

Server blade
(side view)

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

➪ Stealth black front bezel
➪ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
➪ 12 lbs; 5.4kg (max configuration)
➪ RTU 2-core 250W
➪ Configuration/Setup Utility: F1 at startup
➪ Diagnostics (PC-Doctor™): F2 at startup
➪ System Partition Boot: ALT+F1 at startup
➪ Network Boot: F12 at startup
➪ PXE Boot Agent Utility: Ctrl+S at startup
➪ Blade control panel on each JS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
➪ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

See footnotes for important warranty information

IBM BladeCenter® JS21 (8844)

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

Positioning	The IBM BladeCenter JS21 blade server delivers exceptional capabilities for AIX 5L™, HPC Linux Clusters, web serving, and server consolidation. With built-in virtualization, the JS21 is equally suitable for building front-end and mid-tier web farms with virtual Linux partitions, saving time and money on setup and deployment, or migrating older UNIX workloads to BladeCenter to reduce maintenance costs. The JS21 is also optimized for scientific research in life sciences and seismic analysis with its integrated vector accelerator. For the needs of SMB and HPC, the JS21 Express models (E3U, E5U) are available pre-configured with faster 533MHz memory and integrated storage for out-of-the-box functionality at a lower price.
Processor(s) L2 Cache SMP support Implementation	**2 x IBM PowerPC™ 970MP** up to 2.7GHz* Single-Core / up to 2.5GHz* Dual-Core / 64 bit **1MB L2** Cache per core **2-core or 4-core SMP** / two PowerPC Processors (single core or dual core) Server blade contains two IBM PowerPC microprocessors soldered to planar, four DIMM slots, 17X PCI Express, SAS controller, Gigabit Ethernet, Fibre Channel, Myrinet and InfiniBand expansion card support, integrated graphics and dual Gigabit ethernet
Memory	**1, 2 or 4GB** std / **16GB**[13] max / two slots used / two slots available / **PC2-3200** 400MHz CL3 ECC DDR2-SDRAM DIMMs or **PC2-4200** 533MHz CL4 ECC DDR2-SDRAM DIMMs / four DIMM gold-connector slots / DIMMs must be installed in matched pairs [a bank] and banks must match in speed (MHz), though not size / 2-way memory interleave / dual-channel / Chipkill with x4 DIMMs
SAS Disk controller SAS Disk bays External Storage	One integrated / **IBM** SAS controller / two port / on planar / 64-bit 133MHz PCI-X / supports **RAID-0 & 1** Supports max of two non-hot-swap 2.5" / small form factor (SFF) SAS drives / 3.0GB/s / E3X and E5X include one 73GB drive std Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical Architecture/Chipset BUS slots	Single-wide Blade / Supported in IBM BladeCenter, IBM BladeCenter T** and IBM BladeCenter H **IBM U4 Northbridge** / **BCM5780 PCI Express, PCI-X Bridge and HyperTransport Tunnel** for PCIe and Dual Gigabit Ethernet / **AMD 8111 Southbridge** providing USB1.1 and Video / NS PC87427 Super I/O off LPC interface No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet Controllers Network Interface	**Dual Gigabit** 10/100/1000 ethernet controller / **Broadcom® 5780** / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz / full duplex / Wake on LAN® / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or *Optical Passthrough Module* (the second controller requires a second optional switch or OPM) One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
DVD / Diskette / USB Kybd / video / mouse Graphics controller	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® RN50 on Planar / 32MB DDR SDRAM std and max / 15 pin connector

Systems Mgmt	**IBM Integrated Service Processor** / H82166 / IPMI 1.5 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module / Cluster System Management / IBM PowerExecutive™ / HACMP	
	1GB (2x512MB) PC2-4200 ECC CL4 DDR2 RDIMM Kit	41Y2703
	2GB (2x1GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit	41Y2707
	4GB (2x2GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit	41Y2711
	8GB (2x4GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit	41Y2723
	1GB (2x512MB) PC2-3200 ECC CL3 DDR2 RDIMM Kit	39M5821
Diagnostics	**Light Path Diagnostics** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	
	2GB (2x1GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit	39M5809
	4GB (2x2GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit	39M5812
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	8GB (2x4GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit
	IBM 36GB 10K SAS 2.5"SFF NHS HDD	26K5776
	IBM 73GB 10K SAS 2.5" SFF NHS HDD	26K5777
Software ship group Cooling Fans	Documentation CD, IBM Director CD, Device Driver CD Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel	QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter
	26R0890	
	BladeCenter SFF Gigabit Ethernet Expansion Card for BladeCenter	39R8624
	Cisco InfiniBand Expansion Card for BladeCenter	32R1896
Power supply(s) Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system	Myrinet Expansion Card for BladeCenter
	73P6000	
	Cisco 4X InfiniBand Switch Module for BladeCenter	32R1756
	Cisco 4X InfiniBand Expansion Card for BladeCenter	32R1760
	Other options at **ibm.com**/pc/us/accessories	

Server blade (side view)

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

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

➪ Stealth black front bezel
➪ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
➪ 12 lbs; 5.4kg (max configuration)
➪ 31U/E3U 2-core 288W / 51U/E5U 4-core 308W
➪ Configuration/Setup Utility: F1 at startup
➪ Diagnostics (PC-Doctor™): F2 at startup
➪ System Partition Boot: ALT+F1 at startup
➪ Network Boot: F12 at startup
➪ PXE Boot Agent Utility: Ctrl+S at startup
➪ Blade control panel on each JS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
➪ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director
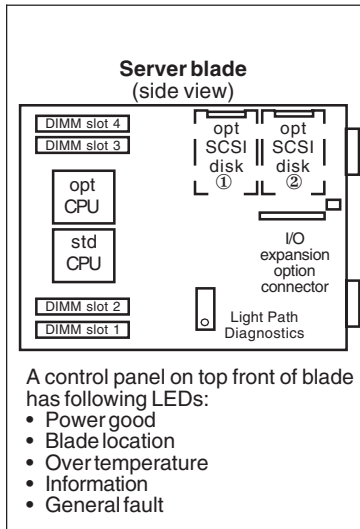
A control panel on top front of blade has following LEDs:
• Power good
• Blade location
• Over temperature
• Information
• General fault

Maximum internal disk capacity for each JS21 blade server[13]*:* 146GB with two 73GB SCSI disks (with BladeCenter Storage Expansion Unit 3 x 73GB for total of 219GB***)

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

LIMITED WARRANTY[3]

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

See footnotes for important warranty information

AMD Opteron LS20 for IBM BladeCenter®

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

Positioning	***Ultra-dense, low power, full performance modular computing platform with superior performance***
Processor(s)	Up to 2 x AMD® Opteron / 280 Dual Core 2.4GHz / 254 Single Core 2.8GHz / simultaneously supports 32-bit and 64-bit computing
L2/L3 Cache	**1MB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O
SMP support	**2-way SMP** / up to two Opteron processors (same speed/cache size)
Implementation	Server blade contains two AMD 940 micro PGA ZIF sockets, four memory DIMM slots, two SCSI connectors, Myrinet and InfiniBand expansion card support, integrated graphics and dual ethernet

Memory	**1 or 2GB** std / 16GB max[13] / two slots used / two slots available
	PC3200 266MHz registered 184-pin ECC DDR VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel
	Error Checking and Correcting (ECC) via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)

IDE controller/bays	None
SCSI disk controller	One integrated / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B / on planar / supports **RAID-1 mirroring** [Embedded Mirroring] with two non-hot-swap 2.5" / small form factor (SFF) drives / one 16-bit internal channel / no cables or external connector)
SCSI disk bays	Supports max of two not hot-swap 2.5" SL Ultra320 SCSI disks 40-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**
Other controllers	Support for SFF or legacy Ethernet or Fibre Channel I/O cards, Myrinet or InfiniBand Expansion cards
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)

Mechanical	Supported in IBM BladeCenter / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
Architecture / chipsets	**AMD 8131 PCI-X Bridge Chip** providing two PCI-X buses running at 600Mhz (bus A for SCSI and Ethernet, bus B for PCI-X expansion slots) / **AMD 8111 HyperTransport Bridge Chip** supporting a 200 Mhz double-pumped HyperTransport clock (PCI, SMBus, USB, LPC to BIOS and Super I/O) / National Semiconductor® PC87417 Super I/O chip
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)

Ethernet controllers	Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full-duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or *Passthrough Module* (the second controller requires a second optional switch or PM)
Network-interface	**One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
DVD / diskette / USB	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon Mobility 7000M / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt	**IBM integrated system management processor** (ISMP) / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module	Low Power Opteron 246 Processor Upgrade — 25R8891
		Low Power Opteron 250 Processor Upgrade — 25R8892
		Low Power Opteron 252 Processor Upgrade — 25R8893
		Low Power Opteron 254 Processor Upgrade — 25R8937
		Low Power Opteron 270 Processor Upgrade — 25R8894
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	Low Power Opteron 275 Processor Upgrade — 25R8895
		Low Power Opteron 280 Processor Upgrade — 25R8896
		2GB (2x1GB kit) DDR-SDRAM VLP RDIMM — 39M5849
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	4GB (2x2GB kit) DDR-SDRAM VLP RDIMM — 39M5852
		8GB (2x4GB kit) DDR-SDRAM VLP RDIMM — 41Y2756
Software ship group	Documentation CD, IBM Director CD, Device Driver CD	IBM 36.4GB SFF Non-hot-swap 10K SCSI HD — 40K1037
		IBM 73.4GB SFF Non-hot-swap 10K SCSI HD — 40K1038
Cooling fans	Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel	AMD Opteron LS20 Low Profile Handle — 25R7748
		BladeCenter SCSI Storage Exp Unit — 26K4817
		IBM SFF Fibre Channel Expansion Card — 26K4841
Power supply	Uses power module(s) in BladeCenter (types 8677, 8852 and 8720)	IBM SFF Gigabit Ethernet Expansion Card — 26K4842
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system	IBM HS20 Fibre Channel Expansion Card — 48P7061
		Other options at **ibm.com**/pc/us/accessories

Server blade
(side view)

DIMM slot 4
DIMM slot 3
opt CPU
std CPU
DIMM slot 2
DIMM slot 1

opt SCSI disk ①
opt SCSI disk ②
I/O expansion option connector
Light Path Diagnostics

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

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

- ⇨ Stealth black front bezel
- ⇨ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- ⇨ 11 lbs; 5.0kg (max configuration)
- ⇨ Configuration/Setup Utility: F1 at startup
- ⇨ Diagnostics (PC-Doctor™): F2 at startup
- ⇨ System Partition Boot: ALT+F1 at startup
- ⇨ Network Boot: F12 at startup
- ⇨ PXE Boot Agent Utility: Ctrl+S at startup
- ⇨ Blade control panel on each LS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- ⇨ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each LS20 blade server[13]:
146GB with two 73.4GB SFF SCSI disks

LIMITED WARRANTY[3]
- ⇨ **3 year parts and labor**
- ⇨ **International Warranty Service**[3]
- ⇨ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
- ⇨ **On site service upgrade options (in eligible locations):**[7]
  - • **3 year IOR 9x5, 4 hr avg response** (ServicePac® part num 41C5906)
  - • **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 41C5907)
  - • **4 year IOR 9x5, 4 hr avg response** (ServicePac part num 41C5908)
  - • **4 year IOR 24x7, 4 hr avg response** (ServicePac part num 41C5909)
  - • **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 41C5910)
  - • **5 year IOR 24x7, 4 hr avg response** (ServicePac part num 41C5911)
  - • **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
- ⇨ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

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

AMD Opteron LS20 for IBM BladeCenter®

IBM® Type-model	Qty x Processor[1]	Speed/Core	Memory	L2 Cache	Disk	Disk controller	Disk bays	SCSI support	Slots x bays	Mech-anical	Required chassis	Available date
8850-56U	1 x Opteron 270	2.0 GHz/DC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U[4] blade	BladeCenter	Mar 2006
8850-66U	1 x Opteron 275	2.2 GHz/DC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-72U	1 x Opteron 250	2.4 GHz/SC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-76U	1 x Opteron 280	2.4 GHz/DC	1GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-82U	1 x Opteron 252	2.6 GHz/SC	2GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006
8850-92U	1 x Opteron 254	2.8 GHz/SC	2GB	1MB	0MB	SCSI	2 fixed	Two 2.5-inch SFF	0x2	7U blade	BladeCenter	Mar 2006

Positioning — ***Ultra-dense, low power, full performance modular computing platform with superior performance***

Processor(s) — Up to 2 x AMD® Opteron / 280 Dual Core 2.4GHz / 254 Single Core 2.8GHz / simultaneously supports 32-bit and 64-bit computing

L2/L3 Cache — **1MB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O

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

Implementation — Server blade contains two AMD 940 micro PGA ZIF sockets, four memory DIMM slots, two SCSI connectors, Myrinet and InfiniBand expansion card support, integrated graphics and dual ethernet

Memory — **1 or 2GB** std / 16GB max[13] / two slots used / two slots available
PC3200 266MHz registered 184-pin ECC DDR VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard
DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel
Error Checking and Correcting (ECC) via **16-bit Checksum Chipkill™** (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)

IDE controller/bays — None

SCSI disk controller — One integrated / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B / on planar / supports **RAID-1 mirroring** [Embedded Mirroring] with two non-hot-swap 2.5" / small form factor (SFF) drives / one 16-bit internal channel / no cables or external connector)

SCSI disk bays — Supports max of two not hot-swap 2.5" SL Ultra320 SCSI disks
40-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**

Other controllers — Support for SFF or legacy Ethernet or Fibre Channel I/O cards, Myrinet or InfiniBand Expansion cards

External storage — Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)

Mechanical Architecture / chipsets — Supported in IBM BladeCenter / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
AMD 8131 PCI-X Bridge Chip providing two PCI-X buses running at 600Mhz (bus A for SCSI and Ethernet, bus B for PCI-X expansion slots) / **AMD 8111 HyperTransport Bridge Chip** supporting a 200 Mhz double-pumped HyperTransport clock (PCI, SMBus, USB, LPC to BIOS and Super I/O) / National Semiconductor® PC87417 Super I/O chip

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

Ethernet controllers — Two gigabit Ethernet controllers / Broadcom® BCM5704S / on blade / two PCI-X 64-bit 133MHz buses / full-duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the dual controllers connects to an optional, supported Ethernet switch or *Passthrough Module* (the second controller requires a second optional switch or PM)

Network-interface — **One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]

DVD / diskette / USB — None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel

Kybd / video / mouse — None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel

Graphics — SVGA / ATI® Radeon Mobility 7000M / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt — **IBM integrated system management processor** (ISMP) / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module

Diagnostics — **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)

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

Software ship group — Documentation CD, IBM Director CD, Device Driver CD

Cooling fans — Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel

Power supply — Uses power module(s) in BladeCenter (types 8677, 8852 and 8720)

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

Low Power Opteron 250 Processor Upgrade	25R8892
Low Power Opteron 252 Processor Upgrade	25R8893
Low Power Opteron 254 Processor Upgrade	25R8937
Low Power Opteron 270 Processor Upgrade	25R8894
Low Power Opteron 275 Processor Upgrade	25R8895
Low Power Opteron 280 Processor Upgrade	25R8896
2GB (2x1GB kit) DDR-SDRAM VLP RDIMM	39M5849
4GB (2x2GB kit) DDR-SDRAM VLP RDIMM	39M5852
8GB (2x4GB kit) DDR-SDRAM VLP RDIMM	41Y2756
IBM 36.4GB SFF Non-hot-swap 10K SCSI HD	40K1037
IBM 73.4GB SFF Non-hot-swap 10K SCSI HD	40K1038
AMD Opteron LS20 Low Profile Handle	25R7748
BladeCenter SCSI Storage Exp Unit	26K4817
IBM SFF Fibre Channel Expansion Card	26K4841
IBM SFF Gigabit Ethernet Expansion Card	26K4842
IBM HS20 Fibre Channel Expansion Card	48P7061

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

Server blade
(side view)

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

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

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

⇨ Stealth black front bezel
⇨ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
⇨ 11 lbs; 5.0kg (max configuration)
⇨ Configuration/Setup Utility: F1 at startup
⇨ Diagnostics (PC-Doctor™): F2 at startup
⇨ System Partition Boot: ALT+F1 at startup
⇨ Network Boot: F12 at startup
⇨ PXE Boot Agent Utility: Ctrl+S at startup
⇨ Blade control panel on each LS20 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
⇨ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each LS20 blade server[13]: 146GB with two 73.4GB SFF SCSI disks

LIMITED WARRANTY[3]
⇨ **3 year parts and labor**
⇨ **International Warranty Service**[3]
⇨ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time**[7]
⇨ **On site service upgrade options (in eligible locations):**[7]
- **3 year IOR 9x5, 4 hr avg response** (ServicePac® part num 41C5906)
- **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 41C5907)
- **4 year IOR 9x5, 4 hr avg response** (ServicePac part num 41C5908)
- **4 year IOR 24x7, 4 hr avg response** (ServicePac part num 41C5909)
- **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 41C5910)
- **5 year IOR 24x7, 4 hr avg response** (ServicePac part num 41C5911)
- **Other ServicePac options at http://www.ibm.com/ services/us/its/pdf/wamomxeu.pdf**
⇨ **24x7**[14] **toll-free support for warranty issues during the warranty period**[3]

See footnotes for important warranty information

AMD® Opteron™ LS21 for IBM BladeCenter®

IBM® Type-model	Qty x Processor[1]	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7971-31U	1 x Opteron 2212HE	2.0GHz/DC	2MB	68W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-3AU	1 x Opteron 2212	2.0GHz/DC	2MB	95W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-51U	1 x Opteron 2216HE	2.4GHz/DC	2MB	68W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7971-6AU	1 x Opteron 2218	2.6GHz/DC	2MB	95W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006

Positioning	***Ultra-dense, low power, dual socket, full performance modular computing platform with superior performance***
Processor(s)	Up to 2 x AMD Opteron 2000 Series Dual Core at up to 2.6GHz / simultaneously supports 32-bit and 64-bit computing
L2 Cache	**1MB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O
SMP support	**2-way SMP** / up to two Opteron processors (same speed/cache size)
Implementation	Systemboard contains two LGA 1207-pin sockets, eight DIMM slots, one Legacy Daughter Card connector, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet
Memory	**1 or 2GB** std / 16GB max[13] (32GB max with 4GB DIMMS*) / two slots used / six slots available **PC5300** 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs / eight DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), hardware scrubbing
IDE controller/bays	None
SAS disk controller	One integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec] / PCI-X 64-bit/133MHz / on planar / supports **RAID-1, 1E & 5** with fully populated Storage and I/O Expansion blade / no cables or external connector
SAS disk bays	One non hot-swap 2.5" SFF SAS disk / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit
External storage	Support for IBM TotalStorage™ solutions
Mechanical	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852
Architecture/Chipsets	**ServerWorks™ Chipset** / **HT2000 HyperTransport System I/O Controller** provides: PCI-Express bridge to Legacy Daughter Card connector and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet controllers	Dual gigabit 10/100/1000 Ethernet controllers / Broadcom® BCM5706S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz bus / full-duplex / TCP/IP OffloadEngine (TOE) / Wake on LAN® / Serial over LAN / Alert Standard Format 1.0 / Load balancing or teaming / Failover, adapter fault tolerance / one of the dual controllers connects to an optional, supported Ethernet switch or *Passthrough Module* (the second controller requires a second optional switch or PM)
Network-interface	**One legacy connector or PCI-Express connector for I/O expansion options** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
DVD / diskette / USB	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus

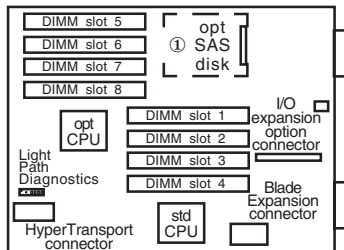|			
Systems mgmt	**IBM Baseboard Management Controller** (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module	Dual Core AMD Opteron Processor Model 2212 HE	25R8898
		Dual Core AMD Opteron Processor Model 2212	25R8931
		Dual Core AMD Opteron Processor Model 2218HE	25R8899
		Dual Core AMD Opteron Processor Model 2218	25R8897
		1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5861
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5864
		4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5867
		8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit*	39M5870
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	IBM 36GB NHS 2.5" SFF SAS HDD	26K5776
		IBM 73GB NHS 2.5" SFF SAS HDD	26K5777
Software ship group	Documentation CD, Device Driver CD, ServerGuide CD	BladeCenter Storage and I/O Expansion Blade	39R7563
		BladeCenter SFF Fibre Channel Expansion Card	26K4841
Cooling fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel	BladeCenter SFF Gigabit Ethernet Expansion Card	39R8624
		QLogic iSCSI Expansion Card for BladeCenter	32R1923
	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)	Cisco 4X InfiniBand Switch Module for BladeCenter	32R1756
Power supply	Monitor, keyboard, mouse for setup; ethernet switch module,	Cisco 4X InfiniBand Expansion Card for BladeCenter	32R1760
Prerequisites	disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system	QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter	26R0890
		Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter	39Y9186
		Other options at **ibm.com**/pc/us/accessories	

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

Server blade
(side view)

DIMM slot 5
DIMM slot 6
DIMM slot 7
DIMM slot 8
opt CPU
Light Path Diagnostics
HyperTransport connector
std CPU
opt SAS disk
DIMM slot 1
DIMM slot 2
DIMM slot 3
DIMM slot 4
I/O expansion option connector
Blade Expansion connector

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

➪ Stealth black front bezel
➪ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
➪ 11 lbs; 5.0kg (max configuration)
➪ Configuration/Setup Utility: F1 at startup
➪ Diagnostics (PC-Doctor™): F2 at startup
➪ Network Boot: F12 at startup
➪ PXE Boot Agent Utility: Ctrl+S at startup
➪ Blade control panel on each LS21 blade provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
➪ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

See footnotes for important warranty information   *4GB DIMMS support available December 2006   (LS21A) © IBM Corp. August 2006

AMD® Opteron™ LS41 for IBM BladeCenter®

IBM® Type-model	Qty x Processor[1]	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7972-31U	1 x Opteron 8212HE	2.0GHz/DC	2MB	68W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-32U	2 x Opteron 8212HE	2.0GHz/DC	2MB	68W	2GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-3AU	1 x Opteron 8212	2.0GHz/DC	2MB	95W	1GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-3BU	2 x Opteron 8212	2.0GHz/DC	2MB	95W	2GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-51U	1 x Opteron 8216HE	2.4GHz/DC	2MB	68W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-52U	2 x Opteron 8216HE	2.4GHz/DC	2MB	68W	4GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006
7972-6AU	1 x Opteron 8218	2.6GHz/DC	2MB	95W	2GB	SAS	1 fixed	SIO/PCIEU	up to 2	single slot blade	2 x Gigabit	Oct 2006
7972-6BU	2 x Opteron 8218	2.6GHz/DC	2MB	95W	4GB	SAS	2 fixed	SIO/PCIEU	up to 2	double slot blade	4 x Gigabit	Oct 2006

Positioning	*Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance*
Processor(s)	Up to 4 x AMD Opteron 8000 Series Dual Core at up to 2.6GHz / simultaneously supports 32-bit and 64-bit computing
L2 Cache	**1MB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O
SMP support	**2 or 4-way SMP** / up to four Opteron processors (same speed/cache size)
Implementation	Systemboard contains up to four LGA1207-pin sockets, up to sixteen DIMM slots, up to two Legacy Daughter Card connectors, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet
Memory	**1, 2 or 4GB** std / 16GB max[13] with double socket blade / 32 GB max[13] with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / **PC5300** 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), hardware scrubbing
SAS disk controller	Up to two integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec] / PCI-X 64-bit/133MHz / on planar / supports **RAID 0, 1** / supports **RAID-1, 1E & 5** with fully populated Storage and I/O Expansion blade / no cables or external connector
SAS disk bays	Up to two non hot-swap 2.5" SFF SAS disks / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit
External storage	Support for IBM TotalStorage™ solutions
Mechanical Architecture/Chipsets	Single or double slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 **ServerWorks™ Chipset** / Up to two **HT2000 HyperTransport System I/O Controllers** providing: PCI-Express bridges to Legacy Daughter Card connectors and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet controllers	Up to four gigabit Ethernet controllers / dual 10/100/1000 Ethernet controllers on single slot blade / Broadcom® BCM5706S / PCI-X 64-bit 133MHz bus / double socket blade adds Broadcom BCM5708S / dual10/100/1000 Ethernet controllers / PCI-Express / up to four full gigabit ethernet MAC and PHY layer functions / full-duplex / TCP/IP OffloadEngine (TOE) / iSCSI / Wake on LAN® / Serial over LAN / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Remote Direct Memory Access (RDMA)
Network-interface	**Up to two legacy connector or PCI-Express connector for I/O expansion options** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
DVD / diskette / USB	None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt	**IBM Baseboard Management Controller** (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module	
	Dual Core AMD Opteron Processor Model 8212 HE	25R8934
	Dual Core AMD Opteron Processor Model 8212	25R8932
	Dual Core AMD Opteron Processor Model 8216 HE	25R8935
	Dual Core AMD Opteron Processor Model 8218	25R8933
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	
	1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5861
	2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5864
	4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit	39M5867
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
	8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit*	39M5870
	IBM 36GB NHS 2.5" SFF SAS HDD	26K5776
	IBM 73GB NHS 2.5" SFF SAS HDD	26K5777
	BladeCenter Storage and I/O Expansion Blade	39R7563
Software ship group	Documentation CD, Device Driver CD, ServerGuide CD	
	BladeCenter SFF Fibre Channel Expansion Card	26K4841
	BladeCenter SFF Gigabit Ethernet Expansion Card	39R8624
Cooling fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel	QLogic iSCSI Expansion Card for BladeCenter	32R1923
	Cisco 4X InfiniBand Switch Module for BladeCenter	32R1756
	Cisco 4X InfiniBand Expansion Card for BladeCenter	32R1760
Power supply	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)	QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter	26R0890
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system	Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter	39Y9186
	Other options at **ibm.com**/pc/us/accessories	

Server blade (side view)

base 2 socket blade

expansion board for 4 socket blade

DIMM slot 5
DIMM slot 6
DIMM slot 7
DIMM slot 8
① opt SAS disk
② opt SAS disk
opt CPU
std CPU
DIMM slot 1
DIMM slot 2
DIMM slot 3
DIMM slot 4
I/O expansion option connector
Light Path Diagnostics
HyperTransport connector
Blade Expansion connector

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

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

➪ Stealth black front bezel
➪ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
➪ 11 lbs; 5.0kg (max configuration)
➪ Configuration/Setup Utility: F1 at startup
➪ Diagnostics (PC-Doctor™): F2 at startup
➪ Network Boot: F12 at startup

➪ PXE Boot Agent Utility: Ctrl+S at startup
➪ Blade control panel on each LS41 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

See footnotes for important warranty information   *4GB DIMMS support available December 2006   (LS41A) © IBM Corp. August 2006

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8720-1RX	All: HS20/HS40/JS20/JS21/LS20	0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U[4] rack	Jul 2004
8720-2RX	All: HS20/HS40/JS20/JS21/LS20	0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U rack	Mar 2006

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

IBM BladeCenter T Advanced Management Module	32R0835	IBM 1300W DC Power Supply Module (x2)	32R0833
McData EFCM Element Managerfor BladeCenter	32R1799	IBM APC Smart-UPS 5000RMB (208V)	37L6861
IBM BladeCenter HS20 Low Profile Handle (800Mhz blade)	25K8360	IBM T115 15" Flat Panel Color Monitor (black)	494215U
IBM BladeCenter HS40 Low Profile Handle	25K8359	BladeCenter PCI I/O Expansion Unit II	25K8373
IBM BladeCenter T Filter	25K8376	IBM DS4000 EXP700 Fibre Channel Expansion Unit	17001RS
NetBAY42 Enterprise Rack Cabinet	930842S	IBM USB Floppy Drive	05K9276
Four Post Rack Mount Kit	32R0837		
Two Post Rack Mount Kit	32R0836	• Other options at **ibm.com**/pc/us/accessories	
		• Solutions available from IBM BladeCenter Alliance program partners	

Front

```
            Switch Plenum
PM    CMM-1        CMM-2    PM
1        PB-1              2
 •       PB-2             •
         PB-3
         PB-4
PM       PB-5           PM
3        PB-6            4
 •       PB-7           •
         PB-8
      Combo   oooo□ □□
            Switch Plenum
```

Rear

```
Blower    switch-module    switch-module    Blower
2             2                1              1
•                                            •
          KVM            LAN
Blower     •              •            Blower
4                                         3
•    switch-module    switch-module    •
          4                3
```

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

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

LIMITED WARRANTY[3]

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

See footnotes for important warranty information   • = Hot-swap
US models announced March 16, 2004

(BC1TA) © IBM Corp. Jan 2005

IBM BladeCenter® T 8730 (AC power)

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Switch modules (type)	Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8730-1RX	All: HS20/HS40/JS20/JS21/LS20	0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U[4] rack	Jul 2004
8730-2RX	All: HS20/HS40/JS20/JS21/LS20	0 / 8	0 / 4	Enet, Fibre Ch, IB, OPM and CPM	1 / 2	2 / 4	1300W	4 / 4	8U rack	Mar 2006

Positioning Description	***Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments*** Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (combo CD-RW/DVD and ports for USB, keyboard, video, mouse)
Blade bays	**Supports all blades HS20/HS40/JS20/JS21/LS20** and PCI I/O Expansion Units / 8 hot-pluggable server bays / front access
Switch modules	*Std:* none; *max:* four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru
Advanced Management Module	*Std:* none; *max:* two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers
Management Modules	*Std:* one; *max:* two / hot-swap / rear access (I/O ports) / comprehensive system management functions / PowerPC® 401 controller / communicates with integrated system management processor on each server blade / multiplexor for console connectivity / controls external Telco alarm panel / ports: DB-15 analog video port, PS/2 keyboard port, PS/2 mouse port, 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers
Power modules	*Std:* two in bays 1 and 2 , *max:* four / hot-swap / front access / input voltage range 180VAC - 264VAC (Min/Max) at 50/60Hz / two IEC320 C14 male appliance connector / 1300 watts / two std modules (in slots 1 & 2) supply power to switch bays 1 & 2, both management modules, blade bays 1 - 4 and media tray; two addititional power modules provide full system redundant power and power to switch bays 3 & 4, and blade bays 5 - 8 *All:* load balancing / voltage-sensing / auto-restart
Blower modules	*Std:* four; *max:* four / Calibrated Vectored Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake
Mechanical	**EIA 19" rack models (8U⁴)** x 20" deep / designed for EIA-310D (types A & C) and UTF four post racks
Optical / USB	24X-10X-24X-8X[6] Combo / Two USB port (Version 1.1) / all USB interface / front access / shared by up to eight blade servers / requests for optical CD, and USB port(s) by pressing CD select button on blade server front panel
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel
Ports	*Rear:* keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / DB15 Telco Alarm Panel *Front:* Two USB (Version 1.1)
Security	Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures
Ethernet	Each of the dual integrated gigabit ethernet controllers on each blade server connects to an optional *GB Ethernet Switch Module*
Systems mgmt	Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software
System LED panel	System LED panel provides power-on, location, critical, major and minor alarm conditions

IBM BladeCenter T Advanced Management Module	32R0835	IBM 1300W AC Power Supply Module (x2)	32R0834
McData EFCM Element Managerfor BladeCenter	32R1799	IBM APC Smart-UPS 5000RMB (208V)	37L6861
IBM BladeCenter HS20 Low Profile Handle (800Mhz blade)	25K8360	IBM T115 15" Flat Panel Color Monitor (black)	494215U
IBM BladeCenter HS40 Low Profile Handle	25K8359	BladeCenter PCI I/O Expansion Unit	25K8373
IBM BladeCenter T Filter	25K8376	IBM DS4000 EXP700 Fibre Channel Expansion Unit	17001RS
NetBAY42 Enterprise Rack Cabinet	930842S	IBM USB Floppy Drive	05K9276
Four Post Rack Mount Kit	32R0837	• Other options at **ibm.com**/products/us	
Two Post Rack Mount Kit	32R0836	• Solutions available from IBM BladeCenter Alliance program partners	

Front

Rear

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

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

See footnotes for important warranty information   • = Hot-swap

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

Positioning	*Ultra-dense, highly manageable modular computing platform with superior performance*
Processor(s)	**1 x Intel® Xeon 2.5 HGz or 3.2GHz** with 533mhz frontside bus / Hyper-Threading technology / NetBurst™ architecture
L2/L3 Cache	**512KB** L2 Cache / **0 - 2MB** L3 Cache / on die of processor / at processor speed
SMP support	**2-way SMP** / up to two Xeon Processors (same speed/cache size)
Implementation	Server blade contains two Intel 604-pin micro-PGA ZIF sockets, four memory DIMM slots, two IDE connectors, one SCSI expansion connector, one I/O expansion option connector, and integrated graphics and dual ethernet

Memory	**1GB** std / 8GB max[13] / two slots used / two slots available / **PC2100** 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips)

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

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

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

Systems mgmt	**IBM integrated system management processor** (ISMP) / H8S2148 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD
Cooling fans	Uses cooling from BladeCenter (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply	Uses power module(s) in BladeCenter (type 8677)
Prerequisites	Monitor, keyboard, mouse for setup / ethernet switch module, disk, BladeCenter (type 8677), operating system

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

* Disk requires SCSI Storage Expansion Unit

Server blade
(side view)

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

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

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

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

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

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

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

(HS20D) © IBM Corp. February 2004

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

Processor(s) SMP - L2 Cache Implementation	**1 x Intel® Xeon 2.8 Low Voltage or 3.6 GHz with 800MHz frontside bus (FSB)** / **EM64T** / **1MB L2 ECC Cache** / Hyper-Threading technology / Low Voltage Proccessors reduce heat output for increased rack density without increased cooling capacity **2-way SMP** / up to two Xeon Processors (same speed/cache size) / **1MB** std and max / at processor speed Systemboard contains two Intel 604-pin micro-PGA ZIF sockets, four DIMM slots, one SCSI expansion connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet
Memory	**512MB/1GB** std / **8GB**[13] max / two slots used / two slots available / **PC2-3200** 400MHz CL2.5 ECC DDR2-SDRAM DIMMs / four 240 pin gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel /
SCSI disk controller SCSI Disk bays External Storage	**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 **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 BUS slots	7U Blade / Supported in IBM BladeCenter T 8720-1XX or 8730-1XX **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 No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet Network Interface CD / Diskette / USB Kybd / video / mouse Graphics controller	**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) **One connector for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20] 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 Diagnostics	**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 **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)
Security Software ship group	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode Documentation CD, Broadcom CD
Cooling Fans Power supply(s) Prerequisites	Uses cooling from BladeCenter T (type 8720/30) / thermal sensors on each processor and BladeCenter modules and front panel Uses power module(s) in BladeCenter T (type 8720/30) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (type 8677), operating system

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

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

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

Server blade
(side view)

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

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

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

Maximum internal disk capacity for each HS20 blade server[13]:
146GB with two 73GB SCSI disks (with BladeCenter SCSI Storage Expansion Unit 2 x 146GB for total of 438GB)
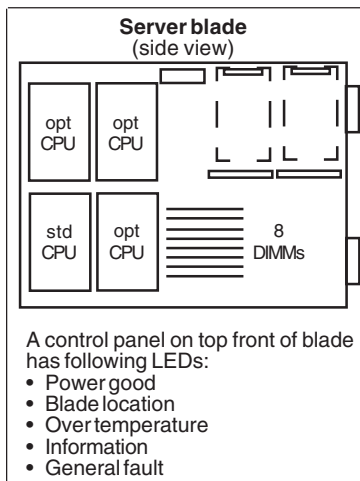
LIMITED WARRANTY[3]

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

See footnotes for important warranty information

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

Positioning	*Ultra-dense, highly manageable modular computing platform with superior 4-way performance*
Processor(s)	Up to **1 x Intel® Xeon 2.8GHz MP** with 400MHz frontside bus / Hyper-Threading technology / NetBurst™ microarchitecture
L2/L3 cache	**512KB L2 Cache / 2MB L3 Cache** / on die of processor / at processor speed
SMP support	**4-way SMP** / up to four Xeon MP Processors (same speed/cache size)
Implementation	Server blade contains four Intel 604-pin micro-PGA ZIF sockets, four memory DIMM slots, one SCSI expansion connector, two I/O expansion option connector, integrated graphics and four ethernet ports
Memory	**2GB** std / **16GB max**[13] / two slots used / six slots available / eight total slots
	PC2100 266MHz registered 184-pin ECC DDR-SDRAM DIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / memory bus runs at 2 x 100MHz / **Error Checking and Correcting (ECC)** via **16-bit Checksum Chipkill**™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips) / memory can be mixed
SCSI disk controller	None / **supports optional SCSI Storage Expansion Unit** (a blade occupying adjacent blade slot / connects to HS20 via one connector / LSI Logic® 53C1020 Ultra320 SCSI controller [LVD 320MB/sec] / 64-bit 133MHz PCI-X Bus B from CIOB-ES I/O Bridge (IMB2 bus to Host Bridge) / supports **RAID-1 mirroring** [Embedded Mirroring] with two hot-swap 3.5" one-inch high SL SCSI disks in front bays / one 16-bit internal channel / no cables or external connector)
SCSI disk bays	Supports max of two hot-swap 3.5" SL Ultra320 SCSI disks in optional SCSI Storage Expansion Unit / 80-pin SCA-2 connectors / **all SCSI bays Ultra320-enabled**
External storage	Support for IBM TotalStorage™ solutions (including FAStT and NAS family of products)
Mechanical	Supported in IBM BladeCenter (type 8677) / BladeCenter supported in 28" deep racks such as the IBM NetBAY™ Rack products
	ServerWorks® Grand Champion™ 4.0 LE / CMIC-LE5 Host Bridge (memory controller and I/O Bridge) /
Architecture / chipsets	one CIOB-X2 I/O Bridge (IMB2 bus to Host Bridge) for two PCI-X Buses with Bus A for ethernet and Bus B for ethernet and the I/O expansion option connector / CSB6 South Bridge (Thin IMB to Host Bridge) for EIDE, USB, LPC bus to Super I/O, and PCI 2.2 Bus C with graphics controller / National Semiconductor® PC87417 Super I/O chip
Bus slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)
Ethernet controllers	Four gigabit 10/100/1000 ethernet controllers / Intel 82545GM/82546EB / on blade / two PCI-X 64-bit 100MHz buses / full duplex / Wake on LAN® / Alert Standard Format 1.0 / teaming and failover support / one of the controllers connects to an optional *4-port GB Ethernet Switch Module* (the second controller requires a second optional Ethernet Switch Module)
Network-interface	**Two connectors for I/O expansion option** (Fibre Channel Expansion Card) / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) / ethernet and serial I/O expansion cards planned for future release[20]
CD / diskette / USB	None / requests for CD-ROM, diskette drive, and USB port in BladeCenter by pressing CD select button on front control panel
Kybd / video / mouse	None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
Graphics	SVGA / ATI® Radeon 7000 / on blade / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus

Systems mgmt	**Intel integrated Baseboard Management Controller** (BMC) / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for communication with BladeCenter management module	
		Xeon 2.8Ghz/2MB L3 Cache Proc Upg — 13N0653
		512MB PC2100 CL2.5 ECC DDR-SDRAM DIMM — 33L5038
		1GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM — 33L5039
Diagnostics	**Light Path Diagnostics**™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)	2GB PC2100 CL2.5 ECC DDR-SDRAM RDIMM — 33L5040
		IBM HS40 SCSI Storge Expansion Unit (blade) — 26K4847
		IBM HS40 Fibre Channel Expansion Card (with two ports; each port requires a FC Switch Module) — 48P7061
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	IBM HS40 40GB[2] 5400 rpm ATA-100 HDD — 48P7063
		36.4GB 15K Ultra160 SCSI Hot-Swap SL HDD* — 06P5768
Software ship group	Documentation CD, IBM Director 4.1 CD, Device Driver CD	36.4GB 15K Ultra320 SCSI Hot-Swap SL HDD* — 06P5776
		73.4GB 10K Ultra160 SCSI Hot-Swap SL HDD* — 06P5756
Cooling fans	Uses cooling from BladeCenter (type 8677) / thermal sensors on each processor and BladeCenter modules and front panel	146.8GB 10K Ultra320 SCSI Hot-Swap SL HDD* — 32P0728
		* *Disk requires SCSI Storage Expansion Unit*
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)

opt CPU / opt CPU / std CPU / opt CPU / 8 DIMMs

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

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

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

LIMITED WARRANTY[3]

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

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

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

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

[2] MB/GB/TB = 1 million/billion/trillion bytes when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition.

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

[4] A single "U", or rack unit, is 1.75" or 44.45mm.

[5] S.M.A.R.T. stands for Self-Monitoring, Analysis and Reporting Technology.

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

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

[8] Subject to conditions.

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

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

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

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

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

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

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

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

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

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

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

[20] Statement of direction and subject to availability.

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

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

IBM®

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States or other countries or both: IBM, Asset ID, C2T Interconnect, Active PCI, Alert on LAN, BladeCenter, Chipkill, ClusterProven, IntelliStation, the e-business logo, LAN Client Manager, Light Path Diagnostics, NetBAY, Netfinity, OS/2, Predictive Failure Analysis, ServerGuide, ServerProven, ServeRAID, ServicePac, SMART Reaction, SystemXtra, TechConnect, ThinkVision, TotalStorage, Update Connector, Wake on LAN, XA-32, XceL4, and xSeries.

Microsoft, Windows and Windows NT are trademarks or registered trademarks of Microsoft Corporation. Intel, Celeron, Pentium, MMX, Itanium and Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Opteron is a trademark or registered trademark of AMD Corporation. Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both. Other company, product and service names may be trademarks or service marks of others.

This publication was developed for products and services offered in the United States. IBM may not offer the products, services of features discussed in this document in other countries. Information is subject to change without notice. Consult your local IBM representative for information on offerings available in your area.

IBM reserves the right to change specifications or other product information without notice. IBM makes no representation or warranty regarding third party products or services. This publication could include technical inaccuracies or typographical errors. References herein to IBM products and services do not imply that IBM intends to make them available in other countries. IBM PROVIDES THIS PUBLICATION AS IS WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express of implied warranties; therefore this disclaimer may not apply to you.

North America

Home | Products & services | Support & downloads | My account

IBM Global Services

→ Select a country

IBM Global Services

Industries

Business & technology topics

IT services

Training

Conferences & events

Services A - Z

IBM Global Services search

Related links:

IBM Business Partners

Career opportunities

What's new | Industries | Topics | IT services

The UK's largest insurance provider is on demand

Norwich Union unveils Pay As You Drive™

🖥 **Flash** (110KB) → Non-Flash
Get the Flash player

New and noteworthy

The untold RFID story
Product innovation in electronics

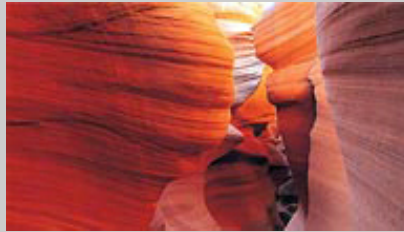**Global outsourcing**
Exploring the human capital challenges

→ **Security and privacy services**
Risk will always be there. We just help you mitigate it.

→ **IBM alliances**
See why the right partners make all the difference.

Global CRM Study

50% of CRM initiatives are successful. Is yours one of them?

Read the study results

News

→ IBM ranked top provider of disaster recovery services

Subscribe

→ Sign up to receive monthly e-mail updates with fresh thinking and in-depth analyses from our consultants.

About IBM | Privacy | Terms of use | Contact