

IBM STG Field Skills Education

System x Reference (xREF)



System x Reference (xREF)

including

IBM®
System x® & BladeCenter®

8 YW_a VYf %*, 2009

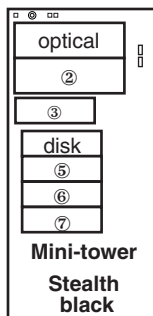


This document is available at
<http://www.redbooks.ibm.com/xref>

| IBM® Machine Type | Machine model | Processor / Speed / Core | FSB MHz | L2 cache | Memory | Disk/Disk controller | Maximum Capacity | slots x bays | Hard disk bays | Power Supply | Ethernet | Available date |
|-------------------|---------------|-----------------------------|---------|----------|---------|----------------------|------------------|--------------|----------------|--------------|----------|----------------|
| 4367/4368 | 22Y | Core™ 2 Duo E4600 2.4GHz/DC | 800 | 2MB | 1x512MB | None/SATA | 3.0TB | 4 x 7 | 4 simple-swap | 1x400W | Gb | Jan 2008 |
| 4367/4368 | 32Y | Xeon® E3110 3.0GHz/DC | 1333 | 6MB | 2x512MB | None/SATA | 3.0TB | 4 x 7 | 4 simple-swap | 1x400W | Gb | Feb 2008 |
| 4367/4368 | 34Y | Xeon E3110 3.0GHz/DC | 1333 | 6MB | 2x512MB | None/SAS/SATA | 3.0TB | 4 x 7 | 4 hot-swap | 1x400W | Gb | Feb 2008 |
| 4367/4368 | 42Y | Xeon X3320 2.5GHz/QC | 1333 | 6MB | 2x512MB | None/SAS/SATA | 3.0TB | 4 x 7 | 4 hot-swap | 1x400W | Gb | Apr 2008 |
| 4367/4368 | 52Y | Xeon X3350 2.66GHz/QC | 1333 | 12MB | 2x512MB | None/SAS | 584GB | 4 x 7 | 4 hot-swap | 1x400W | Gb | Apr 2008 |
| 4367/4368 | 54Y | Xeon X3350 2.66GHz/QC | 1333 | 12MB | 2x512MB | None/SAS/SATA | 3.0TB | 4 x 7 | 4 hot-swap | 2x430W | Gb | Apr 2008 |
| 4367/4368 | 72Y | Xeon X3360 2.83GHz/QC | 1333 | 12MB | 2x512MB | None/SAS/SATA | 3.0TB | 4 x 7 | 4 hot-swap | 1x400W | Gb | Apr 2008 |
| 4367/4368 | 74Y | Xeon X3360 2.83GHz/QC | 1333 | 12MB | 2x512MB | None/SAS | 584GB | 4 x 7 | 4 hot-swap | 2x430W | Gb | Apr 2008 |

| | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|---|--|
| Positioning Processor(s) | <i>Single socket, entry server for small and medium size business' and distributed enterprises</i> Intel® Core 2 Duo up to 2.4GHz 800MHz FSB / Xeon up to 3.0GHz 1333MHz FSB / Dual-Core / Xeon up to 2.83GHz 1333MHz FSB / Quad-Core / All Optimized for Extended Memory 64 Technology (EM64T) | | | | | | | | | | | |
| L2 cache Implementation | 2MB std on Core 2 Duo / 6 or 12MB std on Xeon 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 | | | | | | | | | | | |
| SATA controller Cables Disk | Four channel SATA controller (3.0GB/sec) / supports 4 drives standard / integrated One 1-drop SATA cable per installed hard disk / one 1-drop SATA cable per installed optical drive None standard | | | | | | | | | | | |
| Rack support Bus slots (see below) | 5U ⁴ rack mount support via tower-to-rack kit option One PCI-E x8 / one PCI-E x4 / two 32-bit 33MHz 5v PCI 2.2 slots / one optional 64-bit 133MHz PCI-X slot | | | | | | | | | | | |
| Chipset | Intel 3210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI 2.2, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5027 Super I/O for diskette, parallel, serial, keyboard, mouse | | | | | | | | | | | |
| Ethernet | 10/100/1000 gigabit / Broadcom® 5722 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN® | | | | | | | | | | | |
| Optical / diskette Ports Diagnostics Systems mgmt | DVD-ROM, SATA / None standard <i>Front:</i> two USB (2.0); <i>Rear:</i> two serial (9-pin), parallel, four USB (2.0), ethernet (RJ45) and video Diagnostic LEDs / error LEDs for fans and memory / server diagnostic programs stored on IBM Enhanced Diagnostics CD Mini-baseboard management controller / IPMI 2.0 / 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) / 64MB DDR2 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 | | | | | | | | | | | |
| Software | ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware management software) and many utilities | | | | | | | | | | | |
| Keyboard / mouse Cooling fans Power supply | None standard Three fans (cpu, rear, pwr supply) plus additional fan on SAS models / not redundant / not hot-swap Some: 400W / not hot-swap / no redundancy / some: 430W / hot-swap / redundant / all: universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed) | | | | | | | | | | | |
| | 512MB PC2-5300 ECC DDR2 667MHz 2GB(2x1GB) PC2-5300 ECC DDR2 667MHz 4GB(2x2GB) PC2-5300 ECC DDR2 667MHz IBM 160GB SATA (7.2K) simple-swap HDD IBM 250GB SATA (7.2K) simple-swap HDD IBM 500GB SATA (7.2K) simple-swap HDD IBM 750GB SATA (7.2K) simple-swap HDD 160GB Hot-Swap SATA HDD 250GB Hot-Swap SATA HDD 500GB Hot-Swap SATA HDD 750GB Hot-Swap SATA HDD 73GB 15K 3.5" SAS Hot-Swap HDD 146GB 15K 3.5" SAS Hot-Swap HDD IBM HH SATA Multiburner Comb drive (DVD-RAM) IBM Remote Supervisor Adapter II slimline IBM 5Ux20D Tower-to-Rack Kit IBM SAS HBA Controller | | | | | | | | | | 41Y2726 41Y2729 41Y2732 39M4504 39M4508 39M4514 43W7572 39M4522 39M4526 39M4530 43W7576 40K1043 40K1044 43W8265 39Y9566 42C8923 25R8060 | |

Other options at ibm.com/products/us



- Slot 1: fullsize, PCI-E x8 (x8 electrical)
- Slot 2: fullsize, PCI-E x4 (x1 electrical)
- Slot 3: fullsize, 64-bit 133MHz, 3.3v PCI-X (Optional)
- 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) 2.0
- ◇ 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:
3TB¹³ (4 disks x 750GB)
Maximum hot-swap SAS capacity:
584GB¹³ (4 disks x 146GB)

LIMITED WARRANTY³

- ⇒ 1 year parts and labor standard 4367MTM
- ⇒ 3 year parts and labor standard 4368 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 51J9055)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9054)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9053)
 - 3 year IOR 9x5, NBD response (ServicePac part num 51J9052)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM [®] Machine Type | Machine model | Processor / Speed / Core | FSB MHz | L2 cache | Memory | Disk/Disk controller | slots x bays | Hard disk bays | Power Supply | Ethernet | Available date |
|-------------------------------|---------------|------------------------------------|---------|----------|---------|----------------------|--------------|----------------|--------------|----------|----------------|
| 4367/4368 | B2Y | Core™ 2 Duo E2200 2.2GHz/DC | 800 | 1MB | 1x512MB | Open/SATA | 4 x 7 | 4 simple-swap | 1x400W | Gigabit | Sep 2008 |
| 4367/4368 | C2Y | Core 2 Duo E7200 2.53GHz/DC | 1066 | 3MB | 1x512MB | Open/SATA | 4 x 7 | 4 simple-swap | 1x400W | Gigabit | Sep 2008 |
| 4367/4368 | 76Y | Xeon [®] X3360 2.83GHz/QC | 1333 | 12MB | 2x512MB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x400W | Gigabit | Sep 2008 |
| 4367/4368 | 84Y | Xeon X3370 3.0GHz/QC | 1333 | 12MB | 2x1GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 2x430W | Gigabit | Sep 2008 |
| 4367/4368 | E4U* | Xeon X3370 3.0GHz/QC | 1333 | 12MB | 2x2GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 2x430W | Gigabit | Dec 2008 |
| 4367/4368 | BDY | Xeon E5300 2.6GHz/DC | 800 | 2MB | 2x512MB | Open/SATA | 4 x 7 | 4 simple-swap | 1x400W | Gigabit | June 2009 |
| 4367/4368 | CDY | Core 2 Duo E7400 2.8GHz/DC | 1066 | 3MB | 2x512MB | Open/SATA | 4 x 7 | 4 simple-swap | 1x400W | Gigabit | June 2009 |
| 4367/4368 | 35Y | Xeon E3110 3.0GHz/DC | 1333 | 6MB | 2x512MB | Open/SATA | 4 x 7 | 4 simple-swap | 1x400W | Gigabit | June 2009 |
| 4367/4368 | 38Y | Xeon E3110 3.0GHz/DC | 1333 | 6MB | 2x512MB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x400W | Gigabit | June 2009 |
| 4367/4368 | D2Y | Xeon X3330 2.66GHz/QC | 1333 | 6MB | 2x512MB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x400W | Gigabit | June 2009 |

Positioning Processor(s) *Single socket, entry server for small and medium size business' and distributed enterprises*
Intel[®] Core 2 Duo at 2.2GHz 800MHz FSB Dual-Core / Core 2 Duo at 2.8GHz 1066MHz FSB Dual-Core / Xeon up to 3.0GHz 1333MHz FSB Quad-Core / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **2MB** std on Core 2 Duo / **6 or 12MB** 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, 1 or 2GB** std / 8GB¹³ max / four 184-pin gold-plated DIMM sockets / one or two socket used / **PC2-6400 800MHz 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 4 drives standard / integrated
 Cables One 1-drop SATA cable per installed hard disk / one 1-drop SATA cable per installed optical drive
 Disk None standard

Rack support 5U⁴ rack mount support via tower-to-rack kit option
 Bus slots (see below) One PCI-E x8 / one PCI-E x4 / two 32-bit 33MHz 5v PCI 2.2 slots / one **optional** 64-bit 133MHz PCI-X slot

Chipset **Intel 3210 chipset** / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI 2.2, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / **SMSC[®] SCH5027** Super I/O for diskette, parallel, serial, keyboard, mouse

Ethernet Gigabit Ethernet / Broadcom[®] 5722 / on planar / full-duplex / PHY and MAC layers / Preboot eXecution Environment (PXE) / Wake on LAN[®]

Optical / diskette Ports DVD-ROM, SATA / None standard
 Front: two USB (2.0); Rear: two serial (9-pin), parallel, four USB (2.0), 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 2.0 / monitors system and processor temperature, fan speed and failure, and voltages / **secure remote power on/off / support for optional Remote Supervisor Adapter II**

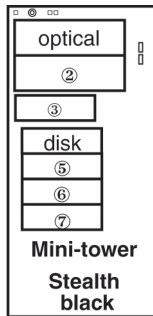
Graphics controller ATI[®] ES1000(RN50) / 16MB DDR2 SDRAM std/max / on planar / analog 15-pin / up to 1024x768x32bit@85Hz

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

Keyboard / mouse None standard
 Cooling fans Three fans (cpu, 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)

- 1GB(2x512MB) PC2-6400 ECC CL6 DDR2 800MHz DIMM Kit 46C7443
- 2GB(2x1GB) PC2-6400 ECC CL6 DDR2 800MHz DIMM Kit 46C7428
- 4GB(2x2GB) PC2-6400 ECC CL6 DDR2 800MHz DIMM Kit 46C7429
- 512MB PC2-5300 ECC DDR2 667MHz 41Y2726
- 2GB(2x1GB) PC2-5300 ECC DDR2 667MHz 41Y2729
- 4GB(2x2GB) PC2-5300 ECC DDR2 667MHz 41Y2732
- 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
- IBM 750GB SATA (7.2K) simple-swap HDD 43W7572
- 160GB Hot-Swap SATA HDD 39M4522
- 250GB Hot-Swap SATA HDD 39M4526
- 500GB Hot-Swap SATA HDD 39M4530
- 750GB Hot-Swap SATA HDD 43W7576
- 1TB Hot-Swap SATA HDD 43W7626
- 146GB 15K 3.5" SAS Hot-Swap HDD 40K1043
- 146GB 15K 3.5" SAS Hot-Swap HDD 40K1044
- IBM HH SATA Multiburner Comb drive (DVD-RAM) 43W8265
- IBM Remote Supervisor Adapter II slimline 39Y9566
- IBM 5Ux20D Tower-to-Rack Kit 42C8923
- IBM SAS HBA Controller 25R8060

Other options at ibm.com/products/us



- Slot 1: fullsize, PCI-E x8 (x8 electrical)
- Slot 2: fullsize, PCI-E x4 (x1 electrical)
- Slot 3: fullsize, 64-bit 133MHz, 3.3v PCI-X (Optional)
- 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) 2.0
- ◇ 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:
 4TB¹³ (4 disks x 1TB)
 Maximum hot-swap SAS capacity:
 584GB¹³ (4 disks x 146GB)

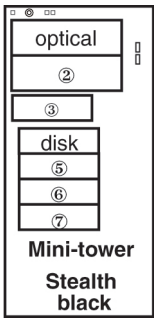
LIMITED WARRANTY³

- 1 year parts and labor standard 4367MTM
- 3 year parts and labor standard 4368 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 51J9055)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9054)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9053)
 - 3 year IOR 9x5, NBD response (ServicePac part num 51J9052)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Machine Type | Model | Processor / Speed / Core | FSB | L3 cache | Memory | Disk/Disk controller | slots x bays | Hard disk bays | Power Supply | Ethernet | Available date |
|-------------------|-------|--------------------------|---------|----------|--------|----------------------|--------------|----------------|--------------|----------|----------------|
| 7327/7328 | C1x | Xeon® X3430 2.4GHz/QC | 1333MHz | 8MB | 2x1GB | Open/SATA | 4 x 7 | 4 simple-swap | 1x401W | 2 x Gb | Oct 2009 |
| 7327/7328 | C2x | Xeon X3430 2.4GHz/QC | 1333MHz | 8MB | 2x1GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x401W | 2 x Gb | Oct 2009 |
| 7327/7328 | 42x | Xeon X3440 2.53GHz/QC | 1333MHz | 8MB | 2x1GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x401W | 2 x Gb | Oct 2009 |
| 7327/7328 | 54x | Xeon X3450 2.67GHz/QC | 1333MHz | 8MB | 2x1GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 2x430W | 2 x Gb | Oct 2009 |
| 7327/7328 | 62x | Xeon X3460 2.8GHz/QC | 1333MHz | 8MB | 2x1GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x401W | 2 x Gb | Oct 2009 |
| 7328 | E3x | Xeon X3430 2.4GHz/QC | 1333MHz | 8MB | 2x4GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 1x401W | 2 x Gb | Nov 2009 |
| 7328 | E4x | Xeon X3450 2.67GHz/QC | 1333MHz | 8MB | 2x4GB | Open/SAS/SATA | 4 x 7 | 4 hot-swap | 2x430W | 2 x Gb | Nov 2009 |

| | |
|--------------------------|---|
| Positioning Processor(s) | Single socket, entry server for small and medium size businesses and distributed enterprises One Intel® Xeon at up to 2.8GHz with 1333MHz FSB and 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / All Optimized for Extended Memory 64 Technology (EM64T) |
| L3 cache Implementation | 8MB std Motherboard contains one LGA-1156 socket, six DIMM sockets, four PCI Express slots, two PCI slots, SAS/SATA support, Matrox video and Gigabit Ethernet. |
| SMP support | No SMP support / no processor upgrade |
| Memory | 2GB std / 32GB¹³ max** / six 240-pin gold-plated DIMM sockets / two socket used / PC3-10600 1333MHz ECC DDR3-SDRAM / All Error Checking and Correcting (ECC) |
| SAS/SATA controller | LSI Logic® 1064e / daughter card / SAS or SATA drives / four-port / PCI-Express / RAID 0,1, 1E / hot-swap models upgradeable to RAID 5 via optional RAID controller (p/n: 43W4296) |
| SATA controller | Six channel SATA controller (3.0Gb/sec) / supports 4 drives std / integrated / RAID 0,1 optional / simple-swap models |
| Cables | One 1-drop SATA cable per installed hard disk / one 1-drop SATA cable per installed optical drive |
| Disk | None standard |
| Rack support | 5U ⁴ rack mount support via tower-to-rack kit option |
| Bus slots (see below) | Two PCI-E x8 Gen2 / one PCI-E x1 / two 32-bit 33MHz 5v PCI 2.2 slots / dedicated PCI-E slot for RAID controller |
| Chipset | Intel 3420 chipset / Platform Controller Hub (PCH) for PCI 2.2, ethernet, USB, Low Pin Count Interface / Firmware Hub |
| Ethernet | Dual Gigabit Ethernet ports / Intel 82574L / fully integrated Gigabit Ethernet Media Access Control(MAC) and Physical-Layer(PHY) capabilities / on planar / full-duplex / Preboot eXecution Environment (PXE) / Wake on LAN® |
| Optical / diskette Ports | DVD-ROM, SATA / None standard <i>Front:</i> two USB (2.0); <i>Rear:</i> one serial (9-pin), four USB (2.0), two ethernet (RJ45) and video |
| Diagnostics | Diagnostic LEDs / error LEDs for fans and memory / preboot DSA integrated on systemboard |
| Systems Management | Integrated Management Module (IMM) / VSC452 / H8S2461 / TPM 1.2 / IPMI 2.0 / SOL / provides system and environmental monitoring, event recording, alert capability / Remote Presence via IBM Virtual Media Key |
| Graphics controller | SVGA / Matrox® G200eV integrated in IMM on systemboard / 128MB DDR2-250MHz SDRAM std/max |
| Security | Mechanical side panel key lock / power-on password / boot sequence control / operation without kybd/mouse |
| Software | ServerGuide™ (CD-based automated network OS installation and configuration tool), IBM Director (system hardware management software) and many utilities |

| | | | |
|------------------|--|---|---------|
| Keyboard / mouse | Optional | 1GB PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM | 44T1480 |
| Cooling fans | Four fans (cpu, rear, pwr supply & HDD cage) / not redundant / not hot-swap | 1GB PC3-10600 CL9 ECC DDR3 1333MHz LP UDIMM | 44T1568 |
| Power supply | Some: 401W / 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) | 2GB PC3-10600 CL9 ECC DDR3 1333MHz LP UDIMM | 44T1569 |
| | | 4GB PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM | 44T1599 |
| | | 4GB PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM | 46C7448 |
| | | IBM 250GB SATA (7.2K) simple-swap HDD | 39M4508 |
| | | IBM 500GB SATA (7.2K) simple-swap HDD | 39M4514 |
| | | IBM 750GB SATA (7.2K) simple-swap HDD | 43W7572 |
| | | 250GB Hot-Swap SATA HDD | 39M4526 |
| | | 500GB Hot-Swap SATA HDD | 39M4530 |
| | | 750GB Hot-Swap SATA HDD | 43W7576 |
| | | 1TB Hot-Swap SATA HDD | 43W7626 |
| | | IBM ServeRAID-MR10i SAS/SATA Controller | 43W4296 |
| | | IBM HH SATA Multiburner Combo drive (DVD-RAM) | 43W8265 |
| | | IBM 5Ux20D Tower-to-Rack Kit | 42C8923 |
| | | IBM 3Gb SAS HBA v2 Controller | 44E8700 |
| | | IBM Virtual Media Key for Remote Presence | 46C7527 |



- Slot 1: fullsize, PCI-E x8 (x8 electrical)
- Slot 2: fullsize, PCI-E x8 (x8 electrical)
- Slot 3: fullsize, PCI-E x4 (x1 electrical)
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- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure
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- ◆ Configuration/Setup Utility (in flash memory) invoked by pressing F1 at startup
- ◆ Advanced Configuration Power Interface (ACPI) 2.0
- ◆ Device Drivers and Diagnostics CD-ROM included
- ◆ Four stabilizing feet
- ◆ H 17.25" x W 8.5" x D 21.25"
- ◆ H 438mm x W 216mm x D 540mm
- ◆ 43 to 47 pounds (19.6 to 21.4kg)

Maximum SATA capacity:
4TB¹³ (4 disks x 1TB)
Maximum hot-swap SAS capacity:
584GB¹³ (4 disks x 146GB)

Other options at ibm.com/products/us

LIMITED WARRANTY³

- 1 year parts and labor standard 7327 MTM
- 3 year parts and labor standard 7328 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, 4 hr avg response (7327 ServicePac part num 43X3852)
 - (7328 ServicePac part num 43X3860)
 - 3 year IOR 9x5, 4 hr avg response (7327 ServicePac part num 43X3851)
 - (7328 ServicePac part num 43X3859)
 - 4 year IOR 24x7, 4 hr avg response (7327 ServicePac part num 43X3855)
 - (7328 ServicePac part num 43X3862)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Machine Type | model | Processor / Speed / Core | L2 cache | FSB MHz | Memory | Disk controller | Disk bays | Mechanical | Slots x bays | Ethernet | Ltd warr ³ | Available date |
|-------------------|-------|-----------------------------|----------|---------|-----------|-----------------|---------------|----------------------|--------------|----------|-----------------------|----------------|
| 4190/4194 | 15Y | Celeron® 440 2.0GHz/SC | 512KB | 800 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U ⁴ rack | 2x3 | Dual Gb | 1/3yr | Jan 2008 |
| 4190/4194 | 22Y | Core™ 2 Duo E4600 2.4GHz/DC | 2MB | 800 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Jan 2008 |
| 4190/4194 | 52Y | Xeon® E3110 3.0GHz/DC | 6MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Feb 2008 |
| 4190/4194 | 62Y | Xeon X3320 2.5GHz/QC | 6MB | 1333 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Apr 2008 |
| 4190/4194 | 64Y | Xeon X3320 2.5GHz/QC | 6MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Apr 2008 |
| 4190/4194 | 66Y | Xeon X3320 2.5GHz/QC | 6MB | 1333 | 2 x 512MB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Apr 2008 |
| 4190/4194 | 72Y | Xeon X3350 2.66GHz/QC | 12MB | 1333 | 2 x 1GB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Apr 2008 |
| 4190/4194 | 74Y | Xeon X3350 2.66GHz/QC | 12MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Apr 2008 |

Positioning Processor(s) *Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure*
Intel® Celeron up to 2.0GHz 800MHz FSB / Core 2 Duo up to 2.4GHz 800MHz FSB Dual-Core / Xeon up to 3.0GHz 1333MHz FSB Dual-Core / Xeon up to 2.66GHz 1333MHz FSB Quad-Core / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **512KB** std on Celeron / **2MB** std on Core 2 Duo / **6 or 12MB** std on Xeon
 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 **1 or 2GB** std / **8GB¹³ max** / four 184-pin gold-plated DIMM sockets / two sockets used / **PC2-5300 667MHz ECC DDR2-SDRAM** / **All Error Checking and Correcting (ECC)** / DIMMs and ECC memory controller / industry std / unbuffered

SAS/SATA controller **LSI Logic® 1064e** / daughter card / supports SAS or SATA drives / four-port / PCI-Express / **RAID 0,1**
 SATA controller **Four channel SATA controller (3.0Gb/sec) / 2 drives supported / integrated into South Bridge / RAID via ServeRAID-BR10i SAS/SATA controller kit(44X0411)**
 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)

Mechanical Architecture / chipsets **EIA 22" Rack (1U⁴) / rack-mount only**
Intel 3210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI-E, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5027 Super I/O for serial, keyboard, mouse
 Bus slots **(See below) two PCI-E™ x8**

Ethernet controllers **Dual-Gigabit** Ethernet ports / Broadcom® 5722 & 5703 / full gigabit ethernet MAC and PHY layer functions / integrated / port one is PCI-E, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)
 Optical / diskette Ports **48X-32X-48X-16X® CD-RW/DVD-ROM, IDE / Diskette: none**
Front: two USB (2.0) / Rear: serial (9-pin), two ethernet (RJ-45), video (DB-15), two USB (2.0), one systems mgt (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**

Systems mgmt **Mini-baseboard management controller / IPMI 2.0 / monitors system and processor temperature, fan failure, and voltages**

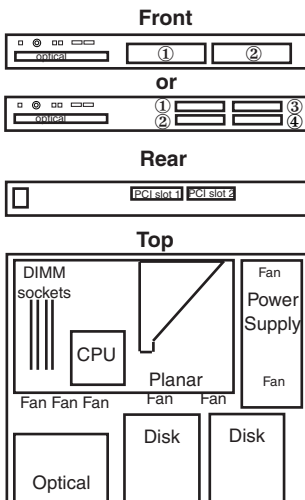
Diagnostics **Diagnostic LEDs/ Error LEDs for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional slimline Remote Supervisor Adapter II with dedicated slot on planar for continuous power (no external power required)**

Security **Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / secure remote power on / off via IPMI 2.0**
 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**

- 512MB PC2-5300 ECC DDR2
- 2GB(2x1GB) PC2-5300 ECC DDR2
- 4GB(2x2GB) PC2-5300 ECC DDR2
- IBM 73GB SFF SAS HDD
- 40K1052
- 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
- IBM 750GB SATA (7.2K) simple-swap HDD
- 43W7572
- 160GB Hot-Swap SATA HDD
- 39M4522
- 250GB Hot-Swap SATA HDD
- 39M4526
- 500GB Hot-Swap SATA HDD
- 39M4530
- 750GB Hot-Swap SATA HDD
- 43W7576
- 73GB 15K 3.5" SAS Hot-Swap HDD
- 40K1043
- 146GB 15K 3.5" SAS Hot-Swap HDD
- 40K1044
- 300GB 15K 3.5" SAS Hot-Swap HDD
- 43X0802
- 73GB 10K SFF SAS Hot-Swap HDD
- 40K1052
- 146GB 10K SFF SAS Hot-Swap HDD
- 43X0824
- 73GB 15K SFF SAS Hot-Swap HDD
- 43X0837
- IBM Remote Supervisor Adapter II slimline
- 39Y9566
- ServeRAID-BR10i SAS/SATA controller kit
- 44X0411
- ServeRAID-MR10i SAS/SATA controller kit
- 43W4296

Other options at ibm.com/products/us



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

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

Maximum internal disk capacity¹³ (model dependent):
 1.5TB with two 750GB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks or 292GB with four 2.5" 73GB SAS disks

LIMITED WARRANTY³

- ⇒ 1 year parts and labor standard 4190 MTM
- ⇒ 3 year parts and labor standard 4194 MTM
- ⇒ International Warranty Service³
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):⁷
- ⇒ 3 year IOR 9x5, NBD avg response (ServicePac part num 51J9180)
- ⇒ 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9181)
- ⇒ 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9182)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Machine Type | Model | Processor / Speed / Core | L2 cache | FSB MHz | Memory | Disk controller | Disk bays | Mechanical | Slots x bays | Ethernet | Ltd warr ³ | Available date |
|-------------------|-------|-----------------------------|----------|---------|-----------|-----------------|---------------|----------------------|--------------|----------|-----------------------|----------------|
| 4190/4194 | B2Y | Core™ 2 Duo E2200 2.2GHz/2C | 1MB | 800 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U ⁴ rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | C2Y | Core 2 Duo E7200 2.53GHz/2C | 3MB | 1066 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | 42Y | Xeon® E3120 3.16GHz/2C | 6MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | D2Y | Xeon X3330 2.66GHz/4C | 6MB | 1333 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | D4Y | Xeon X3330 2.66GHz/4C | 6MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | D6Y | Xeon X3330 2.66GHz/4C | 6MB | 1333 | 2 x 512MB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | 82Y | Xeon X3360 2.83GHz/4C | 12MB | 1333 | 1 x 1GB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | 84Y | Xeon X3360 2.83GHz/4C | 12MB | 1333 | 1 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Sep 2008 |
| 4190/4194 | 1BY | Celeron® 440 2.0GHz/1C | 512KB | 800 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | June 2009 |
| 4190/4194 | BDY | Core 2 Duo E5300 2.6GHz/2C | 2MB | 800 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | June 2009 |
| 4190/4194 | CDY | Core 2 Duo E7400 2.8GHz/2C | 3MB | 1066 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | June 2009 |

Positioning Processor(s) **Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure**
Intel® Core 2 Duo at up to 2.6GHz 800MHz FSB Dual-Core / Core 2 Duo at up to 2.8GHz 1066MHz FSB Dual-Core / Xeon at 3.16GHz 1333MHz FSB Dual-Core / Xeon up to 2.83GHz 1333MHz FSB Quad-Core / Celeron at 2.0GHz 800MHz FSB / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **512KB** std on Celeron / **1, 2 or 3MB** std on Core 2 Duo / **6 or 12MB** std on Xeon
 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 **1GB** std / **8GB¹³** max / four 184-pin gold-plated DIMM sockets / one or two sockets used / **PC2-6400 800MHz 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) / 2 drives supported / integrated into South Bridge / RAID via ServeRAID-BR10i SAS/SATA controller kit(44X0411)

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)

Mechanical Architecture / chipsets **EIA 22" Rack (1U⁴)** / rack-mount only
Intel 3210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI-E, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5027 Super I/O for serial, keyboard, mouse
 Bus slots (See below) two PCI-E™ x8

Ethernet controllers **Dual-Gigabit** Ethernet ports / Broadcom® 5722 & 5703 / full gigabit ethernet MAC and PHY layer functions / integrated / port one is PCI-E, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)
 Optical / diskette **48X-32X-48X-16X⁵** CD-RW/DVD-ROM, IDE / **Diskette:** none
 Ports **Front:** two USB (2.0) / **Rear:** serial (9-pin), two ethernet (RJ-45), video (DB-15), two USB (2.0), one systems mgt (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

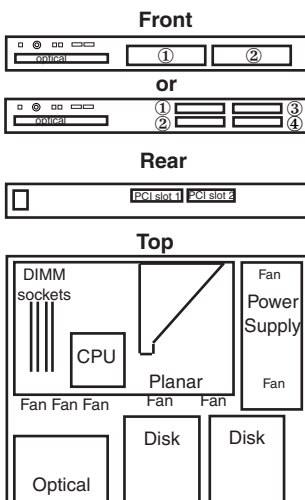
Systems mgmt Mini-baseboard management controller / IPMI 2.0 / monitors system and processor temperature, fan failure, and voltages

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 2.0**
 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

- 1GB(2x512MB) PC2-6400 CL6 ECC DDR2 800MHz DIMM Kit 46C7443
- 2GB(2x1GB) PC2-6400 CL6 ECC DDR2 800MHz DIMM Kit 46C7428
- 4GB(2x2GB) PC2-6400 CL6 ECC DDR2 800MHz DIMM Kit 46C7429
- 512MB PC2-5300 ECC DDR2 41Y2726
- 2GB(2x1GB) PC2-5300 ECC DDR2 41Y2729
- 4GB(2x2GB) PC2-5300 ECC DDR2 41Y2732
- IBM 73GB SFF SAS HDD 40K1052
- 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
- IBM 750GB SATA (7.2K) simple-swap HDD 43W7572
- 160GB Hot-Swap SATA HDD 39M4522
- 250GB Hot-Swap SATA HDD 39M4526
- 500GB Hot-Swap SATA HDD 39M4530
- 750GB Hot-Swap SATA HDD 43W7576
- 1TB Hot-Swap SATA HDD 43W7626
- 73GB 15K 3.5" SAS Hot-Swap HDD 40K1043
- 146GB 15K 3.5" SAS Hot-Swap HDD 40K1044
- 300GB 15K 3.5" SAS Hot-Swap HDD 43X0802
- 73GB 10K SFF SAS Hot-Swap HDD 40K1052
- 146GB 10K SFF SAS Hot-Swap HDD 43X0824
- 73GB 15K SFF SAS Hot-Swap HDD 43X0837
- IBM Remote Supervisor Adapter II slimline 39Y9566
- ServeRAID-BR10i SAS/SATA controller kit 44X0411
- ServeRAID-MR10i SAS/SATA controller kit 43W4296

Other options at ibm.com/products/us



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

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

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

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

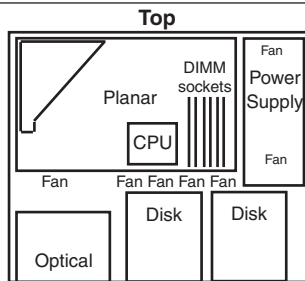
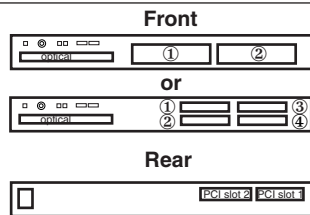
Maximum internal disk capacity¹³ (model dependent):
 2TB with two 1TB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks or 584GB with four 2.5" 146GB SAS disks

LIMITED WARRANTY³

- 1 year parts and labor standard 4190 MTM
- 3 year parts and labor standard 4194 MTM
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD avg response (ServicePac part num 51J9180)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9181)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9182)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

| IBM [®] Machine Type | Machine model | Processor / Speed / Core | L3 cache | FSB MHz | Memory | Disk controller | Disk bays | Mechanical | Slots x bays | Ethernet | Ltd warr ³ | Available date |
|-------------------------------|-------------------------|--------------------------|----------|---------|---------|-----------------|---------------|----------------------|--------------|----------|-----------------------|----------------|
| 4251/4252 C2x | Xeon [®] X3430 | 2.4GHz/4C | 8MB | 1333 | 2 x 1GB | SATA | 2 simple-swap | 1U ⁴ rack | 2x3 | Dual Gb | 1/3yr | Oct 2009 |
| 4251/4252 42x | Xeon X3440 | 2.53GHz/4C | 8MB | 1333 | 2 x 1GB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Oct 2009 |
| 4251/4252 52x | Xeon X3450 | 2.67GHz/4C | 8MB | 1333 | 2 x 1GB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Oct 2009 |
| 4251/4252 62x | Xeon X3460 | 2.8GHz/4C | 8MB | 1333 | 2 x 1GB | SAS/SATA | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Oct 2009 |
| 4252 E3x | Xeon X3440 | 2.53GHz/4C | 8MB | 1333 | 2 x 1GB | SAS/SATA | 2 hot-swap | 1U rack | | Dual Gb | 3yr | Nov 2009 |
| 4252 E4x | Xeon X3450 | 2.67GHz/4C | 8MB | 1333 | 2 x 1GB | SAS/SATA | 2 hot-swap | 1U rack | | Dual Gb | 3yr | Nov 2009 |

| | |
|--------------------------|--|
| Positioning Processor | <i>Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure</i> One Intel[®] Xeon at up to 2.8GHz with 1333MHz FSB and 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / All Optimized for Extended Memory 64 Technology (EM64T) |
| L3 cache Implementation | 8MB std Motherboard contains one LGA-1156 socket, six DIMM sockets, integrated SATA or SAS/SATA, Gigabit Ethernet, Matrox video and two PCI Express [®] x8 slots |
| SMP support | No SMP support / no processor upgrade |
| Memory | 2GB std / 32GB¹³ max** / six 240-pin gold-plated DIMM sockets / two socket used / PC3-10600 1333MHz ECC DDR3-SDRAM / All Error Checking and Correcting (ECC) |
| SAS/SATA controller | LSI Logic[®] 1064e / daughter card / SAS or SATA drives / four-port / PCI-Express / RAID 0,1,1E / hot-swap models upgradeable to RAID 5 via optional RAID controller (p/n: 43W4296) |
| SATA controller | Four channel SATA controller (3.0Gb/sec) / supports 2 drives std / integrated / RAID 0,1 optional / simple-swap models |
| Cables | One 1-drop SATA cable per installed hard disk / one 1-drop SATA cable per installed optical drive |
| Disk | None standard |
| Mechanical Chipset | EIA 22" Rack (1U⁴) / rack-mount only Intel 3420 chipset / Platform Controller Hub (PCH) for PCI 2.2, ethernet, USB, Low Pin Count Interface / Firmware Hub |
| Bus slots (see below) | Two PCI-E x8 Gen2 or One PCI-E x8 and One PCI-X / dedicated PCI-E slot for RAID controller |
| Ethernet | Dual Gigabit Ethernet ports / Intel 82574L / fully integrated Gigabit Ethernet Media Access Control(MAC) and Physical-Layer(PHY) capabilities / on planar / full-duplex / Preboot eXecution Environment (PXE) / Wake on LAN [®] |
| Optical / diskette Ports | Optional / None standard <i>Front:</i> two USB (2.0); <i>Rear:</i> one serial (9-pin), four USB (2.0), two ethernet (RJ45) and video |
| Diagnostics | Diagnostic LEDs / error LEDs for fans and memory / preboot DSA integrated on systemboard |
| Systems Management | Integrated Management Module (IMM) / VSC452 / H8S2461 / TPM 1.2 / IPMI 2.0 / SOL / provides system and environmental monitoring, event recording, alert capability / Remote Presence via IBM Virtual Media Key |
| Graphics controller | SVGA / Matrox [®] G200eV integrated in IMM on systemboard / 128MB DDR2-250MHz SDRAM std/max |
| Security | Power-on password / administrator password / boot sequence control / unattended start mode / secure remote power on/off via IPMI 2.0 |
| Software | ServerGuide[™] (CD-based automated network OS installation and configuration tool), IBM Director (system hardware management software) and many utilities |
| Cooling fans | Four fans (cpu, rear, pwr supply & HDD cage) / not redundant / not hot-swap |
| Power supply | 351W / not hot-swap / non redundant / universal / auto switch / Automatic Server Restart (ASR) / cooling fan in power supply (variable speed) |
| Prerequisites | Monitor, keyboard, mouse, rack, OS |



- 1GB PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM 44T1480
- 2GB PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM 44T1481
- 1GB PC3-10600 CL9 ECC DDR3 1333MHz LP UDIMM 44T1568
- 2GB PC3-10600 CL9 ECC DDR3 1333MHz LP UDIMM 44T1569
- 4GB PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM 44T1599
- 4GB PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM 46C7448
- IBM 250GB SATA (7.2K) simple-swap HDD 39M4508
- IBM 500GB SATA (7.2K) simple-swap HDD 39M4514
- IBM 750GB SATA (7.2K) simple-swap HDD 43W7572
- 250GB Hot-Swap SATA HDD 39M4526
- 500GB Hot-Swap SATA HDD 39M4530
- 750GB Hot-Swap SATA HDD 43W7576
- 1TB Hot-Swap SATA HDD 43W7626
- 146GB 15K 3.5" SAS Hot-Swap HDD 40K1044
- 146GB 10K 2.5" SAS Hot-Swap HDD 42D0632
- 300GB 10K 2.5" SAS Hot-Swap HDD 42D0637
- 73GB 15K 2.5" SAS Hot-Swap HDD 42D0672
- 146GB 15K 2.5" SAS Hot-Swap HDD 42D0677
- 500GB 7200 2.5" NL SAS Hot-Swap HDD 42D0707
- ServeRAID-BR10i SAS/SATA controller v2 kit 49Y4731
- ServeRAID-MR10i SAS/SATA controller kit 43W4296
- IBM UltraSlim Enhanced SATA DVD-ROM 46M0901
- IBM UltraSlim Enhanced SATA MiniBurner 46M0902
- IBM Virtual Media Key for Remote Presence 46C7527

Other options at ibm.com/products/us

- 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, optical optional

Slot 1: 3/4 length, full height, PCI-E x8
Slot 2: half length, low-profile, PCI-E x8
(or PCI-E x8 and PCI-X via optional riser card)

- Raven black front bezel
- H 1.69" (1U) x W 17.3" x D 22"; 43mm x 430mm x 560.1mm
- 24.4 to 25.1 lbs; 11kg to 11.4kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity¹³ (model dependent):
2TB with two 1TB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks
or 584GB with four 2.5" 146GB SAS disks

LIMITED WARRANTY³

- 1 year parts and labor standard 4251 MTM
- 3 year parts and labor standard 4252 MTM
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD avg response (ServicePac part num 51J9075)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9076)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9077)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxueu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

** = 32GB maximum memory with 8GB DIMMs, when available (expected 1Q 2010)

| IBM® Machine Type | Machine model | Processor / Speed / Core | L2 cache | FSB MHz | Memory | Disk controller | Disk bays | Mechanical | Slots x bays | Ethernet | Ltd warr ³ | Available date |
|-------------------|---------------|--------------------------|----------|---------|-----------|-----------------|---------------|----------------------|--------------|----------|-----------------------|----------------|
| 4192/4193 32Y | Xeon® 3065 | 2.33GHz/DC | 4MB | 1333 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U ⁴ rack | 2x3 | Dual Gb | 1/3yr | Jan 2008 |
| 4192/4193 42Y | Xeon 3075 | 2.66GHz/DC | 4MB | 1333 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Jan 2008 |
| 4192/4193 44Y | Xeon 3075 | 2.66GHz/DC | 4MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Jan 2008 |
| 4192/4193 52Y | Xeon E3110 | 3.0GHz/DC | 6MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Feb 2008 |
| 4192/4193 62Y | Xeon X3320 | 2.5GHz/QC | 12MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Apr 2008 |
| 4192/4193 72Y | Xeon X3350 | 2.66GHz/QC | 12MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Apr 2008 |
| 4192/4193 82Y | Xeon X3360 | 2.83GHz/QC | 12MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Apr 2008 |

Positioning Processor(s) *Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure*
Intel® Xeon up to 3.0GHz 1333MHz FSB Dual-Core / Xeon up to 3.0GHz 1333MHz FSB Quad-Core / All Optimized for Extended Memory 64 Technology (EM64T)

L2 cache No SMP support
 SMP support Motherboard contains one LGA-775 socket, four DIMM sockets, integrated SATA or SAS/SATA, Dual Gigabit Ethernet and Implementation two PCI Express® x8 slots

Memory **1 or 2GB** std / 8GB¹³ max / four 240-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) / 2 drives supported / integrated into South Bridge / RAID via ServeRAID-BR10i SAS/SATA controller kit(44X0411)

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)

Mechanical Architecture / chipsets **EIA 22" Rack (1U⁴)** / rack-mount only
Intel 3210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI-E, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5027 Super I/O for serial, keyboard, mouse
 Bus slots (See below) two PCI-E™ x8

Ethernet controllers **Dual-Gigabit** 10/100/1000 ethernet ports / Two Broadcom® 5722 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is PCI-E, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)

Optical / diskette 48X-32X-48X-16X® CD-RW/DVD-ROM, IDE / *Diskette:* none
 Ports *Front:* two USB (2.0), video (DB-15) / *Rear:* serial (9-pin), two ethernet (RJ-45), video (DB-15), two USB (2.0), one systems mgt (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

Systems mgmt **IBM Integrated Baseboard Management Controller(BMC)** / IPMI 2.0 / H82166 / on planar / monitors system and processor temperature, fan failure and voltages / **IBM Active Energy Manager™** / support for optional slimline Remote Supervisor Adapter II with dedicated slot on planar for continuous power (no external power required)

Diagnostics **Light Path Diagnostics** panel providing LED map to failing part (located on front panel) / Diagnostics via preboot DSA on std IBM Enhanced Diagnostics CD (diskette can be created)

Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / **secure remote power on / off via IPMI 2.0**

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

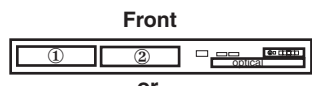
Cooling fans **Calibrated Vectored Cooling™** / Six fans (four fans for system, two in power supplies) / variable speed / redundant and hot-swap

Power supply 450 watt / hot-swap / universal / auto-sensing / auto-restart support

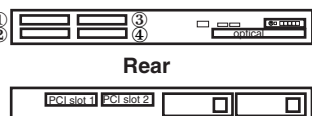
Prerequisites Monitor, keyboard, mouse, rack

- 512MB PC2-5300 ECC DDR2
- 2GB(2x1GB) PC2-5300 ECC DDR2
- 4GB(2x2GB) PC2-5300 ECC DDR2
- IBM 160GB SATA (7.2K) simple-swap HDD
- IBM 250GB SATA (7.2K) simple-swap HDD
- IBM 500GB SATA (7.2K) simple-swap HDD
- IBM 750GB SATA (7.2K) simple-swap HDD
- 160GB Hot-Swap SATA HDD
- 250GB Hot-Swap SATA HDD
- 500GB Hot-Swap SATA HDD
- 750GB Hot-Swap SATA HDD
- 73GB 15K 3.5" SAS Hot-Swap HDD
- 146GB 15K 3.5" SAS Hot-Swap HDD
- 300GB 15K 3.5" SAS Hot-Swap HDD
- 73GB 10K SFF SAS Hot-Swap HDD
- 146GB 10K SFF SAS Hot-Swap HDD
- 73GB 15K SFF SAS Hot-Swap HDD
- IBM Remote Supervisor Adapter II slimline
- ServeRAID-BR10i SAS/SATA controller kit
- ServeRAID-MR10i SAS/SATA controller kit

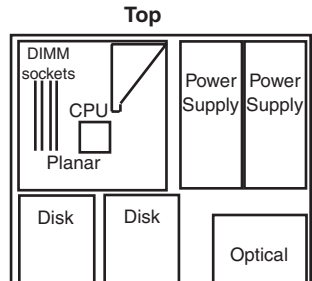
- 41Y2726
- 41Y2729
- 41Y2732
- 39M4504
- 39M4508
- 39M4514
- 43W7572
- 39M4522
- 39M4526
- 39M4530
- 43W7576
- 40K1043
- 40K1044
- 43X0802
- 40K1052
- 43X0824
- 43X0837
- 39Y9566
- 44X0411
- 43W4296



Slot 1: half length, full height, PCI-E x8
 Slot 2: half length, full height, PCI-E x8



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



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

- Raven black front bezel
- H 1.75" (1U) x W 17.32" x D 28"; 43mm x 440mm x 711mm
- 24.4 to 28 lbs; 11kg to 12.7kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity¹³ (model dependent):
 1.5TB with two 750GB 3.5" SATA disks, 600GB with two 300GB 3.5" SAS disks or 292GB with four 2.5" 73GB SAS disks

LIMITED WARRANTY³

- 1 year parts and labor standard 4192 MTM
- 3 year parts and labor standard 4193 MTM
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD avg response (ServicePac part num 51J9142)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9143)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9144)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Machine Type | Machine model | Processor / Speed / Core | L2 cache | FSB MHz | Memory | Disk controller | Disk bays | Mechanical | Slots x bays | Ethernet | Ltd warr ³ | Available date |
|-------------------|---------------|--------------------------|----------|---------|-----------|-----------------|---------------|----------------------|--------------|----------|-----------------------|----------------|
| 4192/4193 B2Y | Xeon® E3120 | 3.16GHz/DC | 6MB | 1333 | 2 x 512MB | SAS/SATA | 2 hot-swap | 1U ⁴ rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4192/4193 B4Y | Xeon E3120 | 3.16GHz/DC | 6MB | 1333 | 2 x 512MB | SATA (no RAID) | 2 simple-swap | 1U rack | 2x3 | Dual Gb | 1/3yr | Sep 2008 |
| 4192/4193 D2Y | Xeon X3330 | 2.66GHz/QC | 6MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Sep 2008 |
| 4192/4193 84Y | Xeon X3360 | 2.83GHz/QC | 12MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Sep 2008 |
| 4192/4193 92Y | Xeon X3370 | 3.0GHz/QC | 12MB | 1333 | 2 x 1GB | SAS | 4 hot-swap | 1U rack | 2x5 | Dual Gb | 1/3yr | Sep 2008 |

Positioning Processor(s) *Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure*
Intel® Xeon up to 3.0GHz 1333MHz FSB / Quad-Core / Xeon up to 3.16GHz 1333MHz FSB / Dual-Core / All Optimized for Extended Memory 64 Technology (EM64T)
 L2 cache **6 or 12MB** std
 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 **1 or 2GB** std / 8GB¹³ max / four 240-pin gold-plated DIMM sockets / two sockets used / **PC2-6400 800MHz 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) / 2 drives supported / integrated into South Bridge / RAID via ServeRAID-BR10i SAS/SATA controller kit(44X0411)

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)

Mechanical Architecture / chipsets **EIA 22" Rack (1U⁴) / rack-mount only**
Intel 3210 chipset / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI-E, ATA-100 EIDE, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / SMSC® SCH5027 Super I/O for serial, keyboard, mouse
 Bus slots (See below) two PCI-E™ x8

Ethernet controllers **Dual Gigabit** ethernet ports / Two Broadcom® 5722 / two full gigabit ethernet MAC and PHY layer functions / integrated / port one is PCI-E, port two is PCI 2.2 / full duplex / PXE / Wake on LAN® / Rear RJ-45 ports (2)

Optical / diskette Ports **48X-32X-48X-16X⁶ CD-RW/DVD-ROM, IDE / Diskette:** none
Front: two USB (2.0), video (DB-15) / **Rear:** serial (9-pin), two ethernet (RJ-45), video (DB-15), two USB (2.0), one systems mgt (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

Systems mgmt **IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H82166 / on planar / monitors system and processor temperature, fan failure and voltages / IBM Active Energy Manager™ / support for optional slimline Remote Supervisor Adapter II with dedicated slot on planar for continuous power (no external power required)**

Diagnostics **Light Path Diagnostics** panel providing LED map to failing part (located on front panel) / Diagnostics via preboot DSA on std IBM Enhanced Diagnostics CD (diskette can be created)

Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / **secure remote power on / off via IPMI 2.0**

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

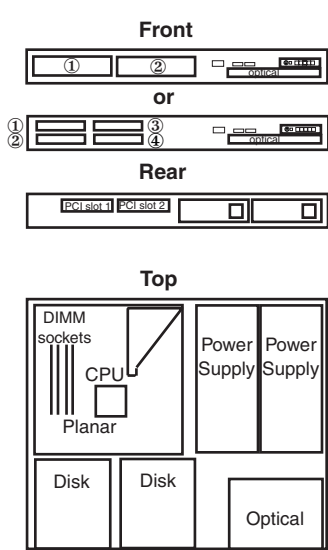
Cooling fans **Calibrated Vectored Cooling™** / Six fans (four fans for system, two in power supplies) / variable speed / redundant and hot-swap

Power supply 450 watt / hot-swap / universal / auto-sensing / auto-restart support

Prerequisites Monitor, keyboard, mouse, rack

- 512MB PC2-5300 ECC DDR2 41Y2726
- 2GB(2x1GB) PC2-5300 ECC DDR2 41Y2729
- 4GB(2x2GB) PC2-5300 ECC DDR2 41Y2732
- 1GB(2x512MB) PC2-6400 CL6 ECC 800MHz DIMM 46C7443
- 2GB(2x1GB) PC2-6400 CL6 ECC 800MHz DIMM 46C7428
- 4GB(2x2GB) PC2-6400 CL6 ECC 800MHz DIMM 46C7429
- 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
- IBM 750GB SATA (7.2K) simple-swap HDD 43W7572
- 160GB Hot-Swap SATA HDD 39M4522
- 250GB Hot-Swap SATA HDD 39M4526
- 500GB Hot-Swap SATA HDD 39M4530
- 750GB Hot-Swap SATA HDD 43W7576
- 73GB 15K 3.5" SAS Hot-Swap HDD 40K1043
- 146GB 15K 3.5" SAS Hot-Swap HDD 40K1044
- 300GB 15K 3.5" SAS Hot-Swap HDD 43X0802
- 73GB 10K SFF SAS Hot-Swap HDD 40K1052
- 146GB 10K SFF SAS Hot-Swap HDD 43X0824
- 73GB 15K SFF SAS Hot-Swap HDD 43X0837
- IBM Remote Supervisor Adapter II slimline 39Y9566
- ServeRAID-BR10i SAS/SATA controller kit 44X0411
- ServeRAID-MR10i SAS/SATA controller kit 43W4296

Other options at ibm.com/products/us



Slot 1: half length, full height, PCI-E x8
 Slot 2: half length, full height, PCI-E x8

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

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

- Raven black front bezel
- H 1.75" (1U) x W 17.32" x D 28"; 43mm x 440mm x 711mm
- 24.4 to 28 lbs; 11kg to 12.7kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- Ships with Diagnostics CD, ServerGuide Setup and Installation CD
- Predictive Failure Analysis on disk(s) with IBM Director can alert the administrator of an imminent component failure

Maximum internal disk capacity¹³ (model dependent):
 1.5TB with two 750GB 3.5" SATA disks, 2TB with two 1TB 3.5" SAS disks or 584GB with four 2.5" 146GB SAS disks

LIMITED WARRANTY³

- 1 year parts and labor standard 4192 MTM
- 3 year parts and labor standard 4193 MTM
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBD avg response (ServicePac part num 51J9142)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 51J9143)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J9144)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Front port / graphics Front: two USB (Vers 2.0); Graphics: 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 H8S2166⁷ / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)

Diagnostics System error LED Panel in front

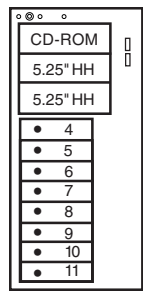
Software ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others

Keyboard / mouse Optional

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

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

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



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

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

LIMITED WARRANTY³

- ⇨ 1 yr parts and labor 7973/7975 MTM
- ⇨ 3 yr parts and labor 7974/7976 MTM
- ⇨ International Warranty Service³
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇨ 3 year on site warranty service upgrade options (ineligible locations):⁷
 - 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac[®] part num 21P2083)
 - 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 21P2084)
 - 24 hr x 7 day coverage, 2 hour average response (ServicePac part number 21P2085)
- ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

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

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

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

| IBM® Type-GAV-model | Qty x Processor | L2 Core cache | Memory | Disk controller | Mechanical | Slots x bays (std/max) | Warranty | Power supply | Ethernet | Available date |
|------------------------|-----------------------|------------------|--------|--------------------|------------|---------------------------|----------|-------------------|----------|-------------------|
| 7973/74-A2x | 1x Xeon™E5405 2.0GHz | QC 12MB | 1GB | Open SATA | Tower | 6x7 (4/4 SS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7973/74-D2x | 1x Xeon E5410 2.33GHz | QC 12MB | 1GB | Open SATA | Tower | 6x7 (4/4 SS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7973/74-J2x | 1x Xeon E5420 2.5GHz | QC 12MB | 1GB | Open SATA | Tower | 6x7 (4/4 SS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7973/74-L2x | 1x Xeon E5430 2.66GHz | QC 12MB | 1GB | Open SATA | Tower | 6x7 (4/4 SS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7975/76-A2x | 1x Xeon E5405 2.0GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7975/76-D2x | 1x Xeon E5410 2.33GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7975/76-J2x | 1x Xeon E5420 2.5GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7975/76-L2x | 1x Xeon E5430 2.66GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 670W fixed | GB | Jan 2008 |
| 7975/76-ABx | 1x Xeon E5405 2.0GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 835W hot-swap | GB | Jan 2008 |
| 7975/76-DBx | 1x Xeon E5410 2.33GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 835W hot-swap | GB | Jan 2008 |
| 7975/76-JBx | 1x Xeon E5420 2.5GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 835W hot-swap | GB | Jan 2008 |
| 7975/76-LBx | 1x Xeon E5430 2.66GHz | QC 12MB | 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 835W hot-swap | GB | Jan 2008 |

Positioning Processor L2 cache SMP support *Universal server: two-way server using the Xeon processor to provide power and performance at an affordable price*
 Up to 1 x Intel® Xeon 2.66GHz with 1333MHz FSB / 12MB L2 ECC Cache / Quad-Core / All EM64T
 12MB / std and max / at processor speed
 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 / 32GB¹³ max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs** / DIMMs must be installed in matched pairs [a bank] / **Fully Buffered** / 2-way memory interleave / dual channel / **Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

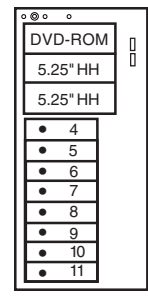
SAS/SATA controller MTs 7973/4: native SATA / on planar / PCI-Express / HostRAID 0 & 1 / MTs 7975/6: ServeRAID 8k-I std / **Adaptec® AIC-9580W / eight port SAS(300MB/sec) or SATA(150MB/sec)** / hot-swap / on planar / PCI-Express / **RAID 0, 1 & 10**
 SAS connectors Dual channel controller wired to hot-swap DASD backplane
 SAS cabling Mini SAS cable connects controller to 4-bay backplane
 IDE controller / cable IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (CD-ROM)
 Disk - capacity None std / supports 7200-15000 rpm disks / single backplane (upgradeable to dual backplanes)
 Disk - bays Some: four hot-swap SAS/SATA bays (upgradeable to eight); some: four simple-swap SATA bays

Mechanical Slots (see below) Chipset Tower / conversion to EIA 26" Rack (5U⁴) via optional kit 39Y8382
 Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, 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)

DVD-ROM / diskette Rear ports Front port / graphics Security 16X⁶ DVD-ROM / IDE / 1.6" HH; *Diskette*: USB only
Rear: two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin), graphics (DB-15), one ethernet (RJ-45), RJ-45 (sys mgmt)
Front: two USB (Vers 2.0); *Graphics*: XVGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2
 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 Power supply Optional
Some: 670 watt / fixed / one std/max; *some*: 835 watt / hot-swap / one/two std/max / redundant with two; *all*: voltage-sensing / auto-restart std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply



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
Hot-Swap SAS/SATA models:
 Bay 4 3.5", SL 1", access, open
 Bay 5 3.5", SL 1", access, open
 Bay 6 3.5", SL 1", access, open
 Bay 7 3.5", SL 1", access, open
 Bay 8 3.5", SL 1", access, open
 Bay 9 3.5", SL 1", access, open
 Bay 10 3.5", SL 1", access, open
 Bay 11 3.5", SL 1", access, open
Simple-Swap SATA models:
 Bay 8 3.5", SL 1", access, open
 Bay 9 3.5", SL 1", access, open
 Bay 10 3.5", SL 1", access, open
 Bay 11 3.5", SL 1", access, open

- Quick release adapter slots
- 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: 2.4TB² with eight 300GB 10K SAS or 6.0TB² with eight 750GB SATA hot-swap HDDs
Simple-Swap models: Max internal disk capacity: 3.0TB² with four 750GB SATA non-hot-swap HDDs

| | |
|---|---------|
| Xeon E5310 1.6GHz/1066MHz/8MB L2 Cache Proc Upg | 43W5821 |
| Xeon E5320 1.86GHz/1066MHz/8MB L2 Cache Proc Upg | 43W5822 |
| Xeon E5335 2.0GHz/1066MHz/8MB L2 Cache Proc Upg | 43W5823 |
| Xeon E5405 2.0GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5630 |
| Xeon E5405 2.33GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5631 |
| Xeon E5405 2.5GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5632 |
| Xeon E5405 2.66GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5633 |
| 1GB Kit (2x512MB DIMM) PC2-5300 CL5 ECC Chipkill AMF | 39M5782 |
| 2GB Kit (2x1GB DIMM) PC2-5300 CL5 ECC Chipkill AMF | 39M5785 |
| 4GB Kit (2x2GB DIMM) PC2-5300 CL5 ECC Chipkill AMF | 39M5791 |
| 8GB Kit (2x4GB DIMM) PC2-5300 CL5 ECC Chipkill AMF | 39M5797 |
| 73GB 10K SAS Hot-Swap HDD | 40K1039 |
| 146GB 10K SAS Hot-Swap HDD | 40K1040 |
| 300GB 10K SAS Hot-Swap HDD | 40K1041 |
| 36GB 15K SAS Hot-Swap HDD | 40K1042 |
| 73GB 15K SAS Hot-Swap HDD | 40K1043 |
| 146GB 15K SAS Hot-Swap HDD | 40K1044 |
| 500GB 7.2K SATA Hot-Swap HDD | 39M4530 |
| IBM Remote Supervisor Adapter II Slimline | 39Y9566 |
| IBM Redundant Power and Cooling Option(NA) | 39Y8487 |
| Other options at www.ibm.com/products/us | |

LIMITED WARRANTY³

- 1 yr parts and labor 7973/7975 MTM
- 3 yr parts and labor 7974/7976 MTM
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (ineligible locations):⁷
 - 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac[™] part num 21P2083)
 - 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 21P2084)
 - 24 hr x 7 day coverage, 2 hour average response (ServicePac part number 21P2085)
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-GAV-model | Qty x Processor | L2 Core cache Memory | Disk controller | Mechanical | Slots x bays (std/max) | Warranty | Power supply | Ethernet | Available date |
|------------------------|-----------------------|-------------------------|--------------------|------------|---------------------------|----------|-------------------|----------|-------------------|
| 7973/74-2Bx | 1x Xeon™E5205 1.86GHz | DC 6MB 1GB | Open SATA | Tower | 6x7 (4/4 SS) | 1/3yr | 1 x 670W fixed | Gb | Nov 2008 |
| 7975/76-2Bx | 1x Xeon E5205 1.86GHz | DC 6MB 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 670W fixed | Gb | Nov 2008 |
| 7975/76-2Cx | 1x Xeon E5205 1.86GHz | DC 6MB 1GB | Open SAS/SATA | Tower | 6x11 (4/8 HS) | 1/3yr | 1 x 835W hot-swap | Gb | Nov 2008 |

Positioning Processor L2 cache SMP support *Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
 Up to **2 x Intel® Xeon 1.86GHz with 1066MHz FSB / 6MB L2 ECC Cache** / Dual-Core / All EM64T
6MB / std and max / at processor speed
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 / **32GB¹³** max / two slots used / six slots available / **PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC)** (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / **Active Memory™: memory mirroring, online-spare memory, Chipkill**

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

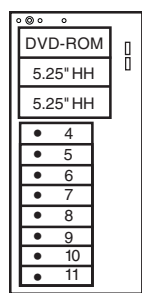
SAS connectors Dual channel controller wired to hot-swap DASD backplane
 SAS cabling Mini SAS cable connects controller to 4-bay backplane
 IDE controller / cable IDE ATA 66/33 / one connector on planar / one 2-drop IDE cable (CD-ROM)
 Disk - capacity None std / supports 7200-15000 rpm disks / single backplane (upgradeable to dual backplanes)
 Disk - bays Some: four hot-swap SAS/SATA bays (upgradeable to eight); some: four simple-swap SATA bays

Mechanical Slots (see below) Chipset Tower / conversion to EIA 26" Rack (5U⁴) via optional kit 39Y8382
 Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, 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)

DVD-ROM / diskette 16X⁶ DVD-ROM / IDE / 1.6" HH; *Diskette*: USB only
 Rear ports *Rear*: two USB (Vers 2.0), keyboard, mouse, parallel, **two** serial (9-pin), graphics (DB-15), one ethernet (RJ-45), RJ-45 (sys mgmt)
 Front port / graphics *Front*: two USB (Vers 2.0); *Graphics*: X VGA / ATI® RN50(ES1000) / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.2
 Security Power-on password / administrator password / front door to cover disk bays and power button / unattended boot / selectable boot

| Systems mgmt | Diagnosics | Software | Keyboard / mouse | Power supply | Fans |
|---|---------------------------------|---|------------------|--|---|
| 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) | System error LED Panel in front | ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others | Optional | <i>Some</i> : 670 watt / fixed / one std/max; <i>some</i> : 835 watt / hot-swap / one/two std/max / redundant with two; <i>all</i> : voltage-sensing / auto-restart std/max: three/six / three fans (mid-chassis) / variable speed / hot-swap (Opt) two additional mid-chassis fans and one rear / redundant with optional fans / PFA / fan in each power supply | Xeon E5205 1.86GHz/1066MHz/6MB L2 Cache Proc Upg 44E5134 1GB Kit (2x512MB DIMM) PC2-5300 CL5 ECC Chipkill AMF 39M5782 2GB Kit (2x1GB DIMM) PC2-5300 CL5 ECC Chipkill AMF 39M5785 4GB Kit (2x2GB DIMM) PC2-5300 CL5 ECC Chipkill AMF 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 7200 rpm SATA Hot-Swap HDD 39M4518 160GB 7200 rpm SATA Hot-Swap HDD 39M4522 250GB 7200 rpm SATA Hot-Swap HDD 39M4526 80GB 7200 rpm SATA Simple-Swap HDD 39M4500 160GB 7200 rpm SATA Simple-Swap HDD 39M4504 250GB 7200 rpm SATA Simple-Swap HDD 39M4508 IBM Remote Supervisor Adapter II Slimline 39Y9566 IBM Redundant Power and Cooling Option(NA) 39Y8487 IBM ServeRAID-MR10i0s VAULT SAS/SATA Controller 44E8695 Other options at www.ibm.com/products/us |



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
Hot-Swap SAS/SATA models:
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 Bay 8 3.5", SL 1", access, open
 Bay 9 3.5", SL 1", access, open
 Bay 10 3.5", SL 1", access, open
 Bay 11 3.5", SL 1", access, open
Simple-Swap SATA models:
 Bay 8 3.5", SL 1", access, open
 Bay 9 3.5", SL 1", access, open
 Bay 10 3.5", SL 1", access, open
 Bay 11 3.5", SL 1", access, open

- ⇨ Quick release adapter slots
- ⇨ Configuration/Setup Utility invoked by pressing F1 at startup
- ⇨ RAID Configuration Utility near startup by pressing CTRL+A
- ⇨ ACPI 2.0-compliant
- ⇨ Operator Information Panel (in front)
- ⇨ Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- ⇨ Tower: H 17.3" x W 8.6" x D 29.4"
- ⇨ 42 to 84 pounds
- ⇨ Stealth black color

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

Hot-Swap models: Max internal disk capacity: 6.0TB² with eight 750GB SATA hot-swap HDDs
Simple-Swap models: Max internal disk capacity: 3.0TB² with four 750GB SATA non-hot-swap HDDs

LIMITED WARRANTY³

- ⇨ 1 yr parts and labor 7973/7975 MTM
- ⇨ 3 yr parts and labor 7974/7976 MTM
- ⇨ International Warranty Service³
- ⇨ On site, 8 am - 5 pm, M-F coverage excluding holidays, next business day response time⁷
- ⇨ 3 year on site warranty service upgrade options for 7973/7975 MTM:
 - 9 hr coverage, M-F excluding holidays, 4 hr avg response (ServicePac[®] part number 38R3487)
 - 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 38R3488)
- ⇨ 3 year on site warranty service upgrade options for 7974/7976 MTM:
 - 9 hr coverage, M-F excluding holidays, 4 hr avg response (ServicePac part number 40M6919)
 - 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 40M6920)
- ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period³ (eligible locations only⁷)

| IBM® Type - model | Qty x Processor/ Core | L3 cache | Memory | Disk | Disk controller | Mechanical | Slots x bays (hot-swap bays) | Power supply | Ethernet | Available date |
|----------------------|----------------------------|-------------|--------|------|--------------------|------------|---------------------------------|--------------|----------|-------------------|
| 7836/37-12x | 1 x Xeon™ E5502 1.86GHz/2C | 4MB | 2x1GB | Open | SATA | Tower | 6x7 (4 SS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-14x | 1 x Xeon E5502 1.86GHz/2C | 4MB | 2x1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-22x | 1 x Xeon E5504 2.0GHz/4C | 4MB | 2x1GB | Open | SATA | Tower | 6x7 (4 SS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-24x | 1 x Xeon E5504 2.0GHz/4C | 4MB | 2x1GB | Open | SAS/SATA | Tower | 6x7 (4 HS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-32x | 1 x Xeon E5520 2.26GHz/4C | 8MB | 2x1GB | Open | SATA | Tower | 6x7 (4 SS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-34x | 1 x Xeon E5520 2.26GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-42x | 1 x Xeon E5530 2.4GHz/4C | 8MB | 2x1GB | Open | SATA | Tower | 6x7 (4 SS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-44x | 1 x Xeon E5530 2.4GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 6x7 (4 HS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7836/37-52x | 1 x Xeon E5540 2.53GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std) | 1 x 670W | 2 x Gb | June 2009 |
| 7837-E1x | 1 x Xeon E5520 2.26GHz/4C | 8MB | 3x1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std) | 1 x 670W | 2 x Gb | July 2009 |
| 7837-E3x | 2 x Xeon E5540 2.53GHz/4C | 8MB | 6x2GB | Open | SAS/SATA | Tower | 6x11 (8 HS std) | 1 x 670W | 2 x Gb | July 2009 |

Positioning Processor(s) **Flexible configuration capabilities and outstanding performance that drives affordable business growth**
Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.53GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 1.86GHz with 4MB L3 / 4 Core / Hyper-Threading

L3 cache **4 or 8MB** std and max / at processor speed

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

Implementation Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, five PCI-E slots, one PCI slot, and integrated SAS/SATA, ethernet and graphics controllers

Memory **2GB std / 48GB max per processor(using 8GB DIMMs*) / PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs / twelve slots on systemboard / six DIMMS per processor / ChipKill / memory mirroring**

Disk Controller **LSI Logic® 1068 SAS/SATA controller / up to eight port / PCI-Express / supports RAID-0/1/1E on hot-swap models upgradeable to LSI 1078(RAID-0/1/5/6/10/50/60) / optional battery backed cache / SATA controller integrated into ICH10 for simple-swap models**

Disk bays Either **Eight 2.5-inch SFF SAS** hot swap disk bays or **Four 3.5-inch SAS/SATA** simple/hot swap disk bays std

Mechanical Architecture/Chipset **Tower / conversion to EIA 26" Rack (5U⁴) via CTO**
Intel 5500 Chipset / Intel IO Hub provides PCI-Express slots 1-5 and links to BCM5709C, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O, PCI-Express slot 6 and a PCI slot
 (See below) One PCI-Express 2nd Gen x16 slot / Four PCI-Express 2nd Gen x8 slots(one reserved for SAS controller) / One PCI-Express 1st Gen x8 slot / One 32-bit 33MHz PCI 2.2 slot / optional to add two 64-bit PCI-X or one PCI-Express x8 slots

Ethernet **Two Gigabit Ethernet ports / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated /PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing**

Optical / diskette Front & Rear ports **16X⁶ DVD-ROM / SATA / USB diskette only**
 Graphics **Front: two USB (2.0) / Rear: four USB (2.0), serial (9-pin), graphics (DB-15), three RJ-45 (2 enet, 1 sys mgmt) SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / 32-bit 33MHz PCI 2.2**

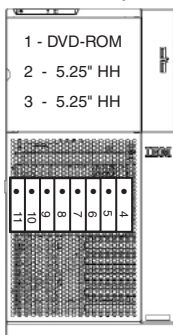
Systems Mgmt **Integrated Management Module (IMM) / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key**

Diagnostics **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics via preboot DSA

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

| | | | |
|------------------|---|---|---------|
| Publications | Installation Guide and Documentation CD | Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache | 46D1350 |
| Keyboard / mouse | Standard / USB only | Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache | 46D1351 |
| Power supply(s) | <i>Std/Max:</i> one 670 watt / fixed / rear access / auto restart | Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache | 46D1352 |
| Cooling | Calibrated Vecteded Cooling™ <i>Std/Max:</i> three / hot-swap / redundant / variable speed / PFA | Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache | 46D1353 |
| Prerequisites | Monitor, SAS/SATA disk, rack, OS | Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache | 46D1355 |
| | | Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache | 46D1357 |

Tower (SFF SAS shown)



- 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 2.5", SFF .5" access, hot-swap
- Bay 5 2.5", SFF .5" access, hot-swap
- Bay 6 2.5", SFF .5" access, hot-swap
- Bay 7 2.5", SFF .5" access, hot-swap
- Bay 8 2.5", SFF .5" access, hot-swap
- Bay 9 2.5", SFF .5" access, hot-swap
- Bay 10 2.5", SFF .5" access, hot-swap
- Bay 11 2.5", SFF .5" access, hot-swap

- 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 8.5" x D 27.6"
- 44 to 77 pounds
- Stealth black color

- Slot 1: half-length, PCI-Express x8(x8 electrical)
- Slot 2: full, PCI-Express x16 (x8 electrical)
- Slot 3: full, PCI-Express x8 (x4 electrical)
- Slot 4: full, PCI-Express x8 (x4 electrical)
- Slot 5: full, PCI-Express x8 (x8 electrical)
- Slot 6: half-length, 32-bit 33MHz 5.0v PCI
- **optional to add 2 - PCI-X or 1 PCI-E x8 slots via extender card

Max internal disk capacity:
 2.4TB² with 8 300GB SFF SAS hot-swap HDDs
 4.0TB² with 4 1TB SATA hot-swap HDDs
 3.0TB² with 4 750GB SATA simple-swap HDDs

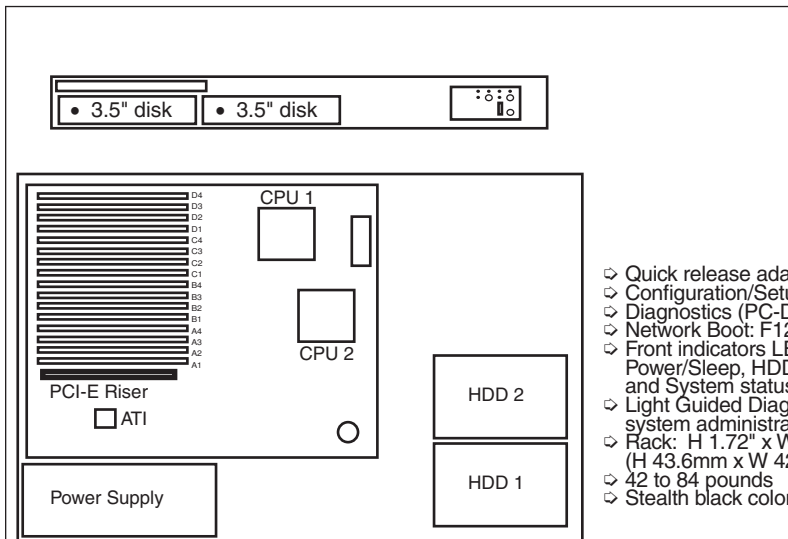
- 46D1350
- 46D1351
- 46D1352
- 46D1353
- 46D1355
- 46D1357
- 44T1480
- 44T1481
- 44T1482
- 44T1483
- 46C7527
- 44E8689
- 43W4296
- 42D0672
- 42D0677
- 42D0632
- 42D0637
- 39M4504
- 39M4508

LIMITED WARRANTY³
 1yr / 3yr parts and labor 7836/7837 MTM
 International Warranty Service³
 On site, 8 am - 5 pm, M-F coverage excluding holidays, nbd response time⁷
 3 year on site warranty service upgrade options for 7836 MTM:
 9 hr coverage, M-F excluding holidays, 4 hr avg response (ServicePac® part number 68Y5576)
 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 68Y5577)
 3 year on site warranty service upgrade options for 7837 MTM:
 9 hr coverage, M-F excluding holidays, 4 hr avg response (ServicePac part number 68Y5567)
 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 68Y5568)
 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵ (eligible locations only⁷)

See footnotes for important warranty information

• = Hot-swap
 * = 8GB dimms planned availability: June 2009

| IBM® Type-model | Qty x Processor/Core | L2 cache | Memory | Disk controller | Disk bays | Disks | Optical | Power Supply | Slots x bays | Ethernet | Limited warranty ³ | Available date |
|----------------------------|--|----------------|--------|-----------------|-----------|------------|---------|--------------|--------------|----------|-------------------------------|----------------|
| 7948-22x | 2 x Xeon™ X5272 | 3.4GHz/DC 6MB | 2x2GB | SATA | 2 fixed | (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| 7948-32x | 2 x Xeon E5462 | 2.8GHz/QC 12MB | 2x2GB | SATA | 2 fixed | (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| 7948-42x | 2 x Xeon X5472 | 3.0GHz/QC 12MB | 2x2GB | SATA | 2 fixed | (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| 7948-52x | 2 x Xeon E5472 | 3.0GHz/QC 12MB | 2x2GB | SATA | 2 fixed | (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| 7948-54x | 2 x Xeon E5472 | 3.0GHz/QC 12MB | 8x4GB | SATA | 2 fixed | 1x500GB | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| 7948-56x | 2 x Xeon E5472 | 3.0GHz/QC 12MB | 16x4GB | SATA | 2 fixed | 1x500GB | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| 7948-58x | 2 x Xeon E5472 | 3.0GHz/QC 12MB | 16x4GB | SATA | 2 fixed | 2x500GB | open | 1x600W | 1x2 | 2 x GB | 1 year | May 2008 |
| Positioning Processor | 1U, dual-socket server providing High Performance Computing in space-constrained environments | | | | | | | | | | | |
| L2 cache | Two Intel® Xeon Processors up to 3.0GHz / 12MB L2 ECC Cache / Quad-Core / Two Xeon Processors 3.4GHz / 6MB L2 ECC Cache / Dual-Core / All 1600MHz FSB / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST) | | | | | | | | | | | |
| SMP support Implementation | 12 or 6MB / std and max / at processor speed | | | | | | | | | | | |
| Memory | 2-way SMP / two Xeon Processors (same speed/cache size) standard | | | | | | | | | | | |
| SATA controller | Systemboard contains two Intel LGA771 sockets, sixteen memory gold-connector DIMM slots, one 2nd Generation PCI-E slot, integrated SATA, ethernet and graphics controllers | | | | | | | | | | | |
| SATA connectors | 4, 32 or 64GB std / 64GB ¹³ max / 2, 8 or 16 slots used / 14, 8 or 0 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) / Chipkill | | | | | | | | | | | |
| IDE controller/cable | Integrated in ESB2-E / six port SATA controller (300MB/sec) / on planar / PCI-Express | | | | | | | | | | | |
| Disk - capacity | Two internal SATA ports on systemboard are connected with one-drop SATA cables directly to individual disks | | | | | | | | | | | |
| Disk - bays | Enhanced IDE/ATA 100 controller integrated in I/O Controller Hub / one connector on planar / one 1-drop IDE cable (DVD-ROM) Some: 500Gb or 1TB; some: open / supports 7200 rpm SATA disks / no backplane | | | | | | | | | | | |
| Chipset | Two fixed 3.5" SATA HDD / filler panels installed in each disk bay | | | | | | | | | | | |
| Mechanical | Intel chipset / Intel 5400 Memory Controller Hub (MCH) provides one PCI-Express x16 slot / Enterprise Southbridge(ESB-2E) provides: ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | |
| Bus slots | EIA 19" Rack (1U ⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion (See below) one 2nd Generation PCI-Express x16 slot (x16 Links) | | | | | | | | | | | |
| Ethernet controller | Two 10/100/1000 ethernet ports / Two Intel 82563EB / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear | | | | | | | | | | | |
| Optical / diskette | Open / USB only | | | | | | | | | | | |
| Front & Rear ports | Front: one USB (Vers 2.0); Rear: two USB (Vers 2.0), keyboard and mouse(stacked PS/2s), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (serial) / no parallel port | | | | | | | | | | | |
| Graphics | SVGA / ATI® RN50(ES1000) / rear port / on planar / 32MB DDR std/max / 32-bit/33MHz PCI 2.3 | | | | | | | | | | | |
| Security | Power-on password / administrator password / unattended boot / selectable boot sequence | | | | | | | | | | | |
| Systems mgmt | Intel Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply | | | | | | | | | | | |
| Diagnostics Software | Light Guided Diagnostics / integrated diagnostic LEDs to assist in troubleshooting board level issues | | | | | | | | | | | |
| Keyboard / mouse | System x3450 Quick Setup Guide and Documentation CD: Option Installation Guide, Installation Guide, User's Guide and Hardware Maintenance Manual and Troubleshooting Guide | | | | | | | | | | | |
| Power supply | None standard (because rack-based) / PS/2 | | | | | | | | | | | |
| Fans | Std/Max: one 600 watt / rear access / auto restart / auto-sensing | | | | | | | | | | | |
| Prerequisites | Std/max: five / fixed / variable speed | | | | | | | | | | | |
| | Monitor, keyboard, mouse, SATA disk(some), rack, OS | | | | | | | | | | | |



Slot 1:PCI-Express x16 Gen2 (full height and length)

- ⊕ 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: NIC 1&2 Activity, Power/Sleep, HDD activity, Identification, and System status
- ⊕ Light Guided Diagnostics can alert the system administrator of a component failure
- ⊕ Rack: H 1.72" x W 16.7" x D 27.4" (H 43.6mm x W 424mm x D 696mm)
- ⊕ 42 to 84 pounds
- ⊕ Stealth black color

| | |
|---|---------|
| 4GB PC2-5300 FBD (2 x 2GB) | 39M5791 |
| 8GB PC2-5300 FBD (2 x 4GB) | 39M5797 |
| IBM 250GB 7.2K rpm SATA simple-swap HDD | 39M4508 |
| IBM 500GB 7.2K rpm SATA simple-swap HDD | 39M4514 |
| IBM 750GB 7.2K rpm SATA simple-swap HDD | 43W7572 |

Other options at ibm.com/products/us

LIMITED WARRANTY³

- ⊖ 1 year parts and labor
- ⊖ International Warranty Service³
- ⊖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⊖ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9-5PM coverage, Mon-Fri excluding holidays, NBD response time (ServicePac[®] 51J9496)
 - 9-5PM coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac 51J9497)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 51J9498)
- ⊖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

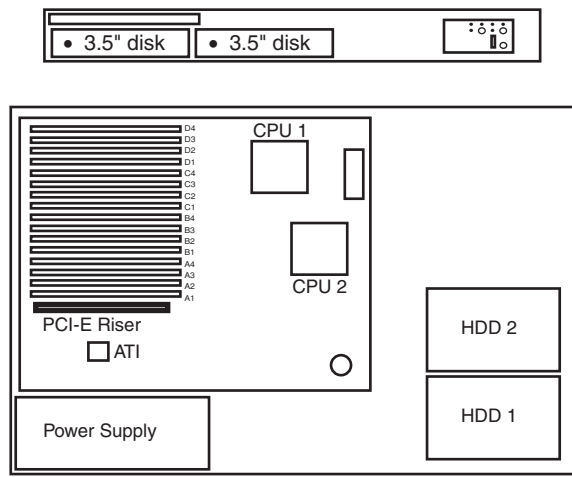
Max internal disk capacity:
3.5" SATA models: 1.5TB² with two 750GB SL disks

See footnotes for important warranty information

| IBM® Type-model | Qty x Processor/Core | L2 cache | Memory | Disk controller | Disk bays | Disks | Optical | Power Supply | Slots x bays | Ethernet | Limited warranty ³ | Available date |
|----------------------------|--|----------|--------|-----------------|--------------------|-------|---------|--------------|--------------|----------|-------------------------------|----------------|
| 7948-2Cx | 2 x Xeon™ X5272 3.4GHz/DC | 6MB | 2x4GB | SATA | 2 fixed (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | Sep 2008 | |
| 7948-3Cx | 2 x Xeon E5462 2.8GHz/DC | 12MB | 2x4GB | SATA | 2 fixed (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | Sep 2008 | |
| 7948-5Cx | 2 x Xeon E5472 3.0GHz/QC | 12MB | 2x4GB | SATA | 2 fixed (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | Sep 2008 | |
| 7948-6Cx | 2 x Xeon X5482 3.2GHz/QC | 12MB | 2x4GB | SATA | 2 fixed (open 3.5) | open | 1x600W | 1x2 | 2 x GB | 1 year | Nov 2008 | |
| 7948-5Dx | 2 x Xeon E5472 3.0GHz/QC | 12MB | 8x4GB | SATA | 2 fixed 1x500GB | open | 1x600W | 1x2 | 2 x GB | 1 year | Sep 2008 | |
| 7948-5Fx | 2 x Xeon E5472 3.0GHz/QC | 12MB | 16x4GB | SATA | 2 fixed 1x500GB | open | 1x600W | 1x2 | 2 x GB | 1 year | Sep 2008 | |
| 7948-5Gx | 2 x Xeon E5472 3.0GHz/QC | 12MB | 16x4GB | SATA | 2 fixed 2x500GB | open | 1x600W | 1x2 | 2 x GB | 1 year | Sep 2008 | |
| Positioning Processor | 1U, dual-socket server providing High Performance Computing in space-constrained environments Two Intel® Xeon Processors up to 3.2GHz / 12MB L2 ECC Cache / Quad-Core / Two Xeon Processors 3.4GHz / 6MB L2 ECC Cache / Dual-Core / All 1600MHz FSB / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST) | | | | | | | | | | | |
| L2 cache | 12 or 6MB / std and max / at processor speed | | | | | | | | | | | |
| SMP support Implementation | 2-way SMP / two Xeon Processors (same speed/cache size) standard Systemboard contains two Intel LGA771 sockets, sixteen memory gold-connector DIMM slots, one 2nd Generation PCI-E slot, integrated SATA, ethernet and graphics controllers | | | | | | | | | | | |
| Memory | 4, 32 or 64GB std / 64GB ¹³ max / 2, 8 or 16 slots used / 14, 8 or 0 slots available / PC2-6400 800MHz 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) / Chipkill | | | | | | | | | | | |
| SATA controller | Integrated in ESB2-E / six port SATA controller (300MB/sec) / on planar / PCI-Express | | | | | | | | | | | |
| SATA connectors | Two internal SATA ports on systemboard are connected with one-drop SATA cables directly to individual disks | | | | | | | | | | | |
| IDE controller/cable | Enhanced IDE/ATA 100 controller integrated in I/O Controller Hub / one connector on planar / one 1-drop IDE cable (DVD-ROM) | | | | | | | | | | | |
| Disk - capacity | Some: 500Gb or 1TB; some: open / supports 7200 rpm SATA disks / no backplane | | | | | | | | | | | |
| Disk - bays | Two fixed 3.5" SATA HDD / filler panels installed in each disk bay | | | | | | | | | | | |
| Chipset | Intel chipset / Intel 5400 Memory Controller Hub (MCH) provides one PCI-Express x16 slot / Enterprise Southbridge(ESB-2E) provides: ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | |
| Mechanical | EIA 19" Rack (1U ⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion | | | | | | | | | | | |
| Bus slots | (See below) one 2nd Generation PCI-Express x16 slot (x16 Links) | | | | | | | | | | | |
| Ethernet controller | Two 10/100/1000 ethernet ports / Two Intel 82563EB / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear | | | | | | | | | | | |
| Optical / diskette | Open / USB only | | | | | | | | | | | |
| Front & Rear ports | Front: one USB (Vers 2.0); Rear: two USB (Vers 2.0), keyboard and mouse(stacked PS/2s), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (serial) / no parallel port | | | | | | | | | | | |
| Graphics | SVGA / ATI® RN50(ES1000) / rear port / on planar / 32MB DDR std/max / 32-bit/33MHz PCI 2.3 | | | | | | | | | | | |
| Security | Power-on password / administrator password / unattended boot / selectable boot sequence | | | | | | | | | | | |
| Systems mgmt | Intel Integrated Baseboard Management Controller(BMC) / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply | | | | | | | | | | | |
| Diagnostics Software | Light Guided Diagnostics / integrated diagnostic LEDs to assist in troubleshooting board level issues System x3450 Quick Setup Guide and Documentation CD: Option Installation Guide, Installation Guide, User's Guide and Hardware Maintenance Manual and Troubleshooting Guide | | | | | | | | | | | |
| Keyboard / mouse | None standard (because rack-based) / PS/2 | | | | | | | | | | | |
| Power supply | Std/Max: one 600 watt / rear access / auto restart / auto-sensing | | | | | | | | | | | |
| Fans | Std/max: five / fixed / variable speed | | | | | | | | | | | |
| Prerequisites | Monitor, keyboard, mouse, SATA disk(some), rack, OS | | | | | | | | | | | |

| | |
|---|---------|
| 4GB PC2-6400 FBD (2 x 2GB) | 46C7571 |
| 8GB PC2-6400 FBD (2 x 4GB) | 46C7572 |
| IBM 250GB 7.2K rpm SATA simple-swap HDD | 39M4508 |
| IBM 500GB 7.2K rpm SATA simple-swap HDD | 39M4514 |
| IBM 750GB 7.2K rpm SATA simple-swap HDD | 43W7572 |

Other options at ibm.com/products/us



- ⊖ 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: NIC 1&2 Activity, Power/Sleep, HDD activity, Identification, and System status
- ⊖ Light Guided Diagnostics can alert the system administrator of a component failure
- ⊖ Rack: H 1.72" x W 16.7" x D 27.4" (H 43.6mm x W 424mm x D 696mm)
- ⊖ 42 to 84 pounds
- ⊖ Stealth black color

LIMITED WARRANTY³

- ⊖ 1 year parts and labor
- ⊖ International Warranty Service³
- ⊖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⊖ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9-5PM coverage, Mon-Fri excluding holidays, NBD response time (ServicePac® 51J8880)
 - 9-5PM coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac 51J8881)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 51J8882)
- ⊖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Slot 1:PCI-Express x16 Gen2 (full height and length)

Max internal disk capacity:
3.5" SATA models: 1.5TB² with two 750GB SL disks

See footnotes for important warranty information

| IBM® Type-model | Qty x Processor | Speed/Core | L2 Cache | Optical | Memory | Disk / Controller / bays | Slots x bays | Ethernet | Warranty ³ (years) | Available date |
|-----------------|--------------------|------------|----------|---------|--------|--------------------------|--------------|--------------|-------------------------------|----------------|
| 7940 - 32U | 1 x Opteron™ 2352 | 2.1GHz/QC | 2MB | Open | 2x1GB | 160GB / SATA / 2 fixed | 2x3 | Dual Gigabit | 1 | June 2008 |
| 7940 - 52U | 1 x Opteron 2356 | 2.3GHz/QC | 2MB | Open | 2x1GB | 160GB / SATA / 2 fixed | 2x3 | Dual Gigabit | 1 | June 2008 |
| 7940 - 62U | 2 x Opteron 2360SE | 2.5GHz/QC | 2MB | Open | 4x2GB | 160GB / SATA / 2 fixed | 2x3 | Dual Gigabit | 1 | July 2008 |

Positioning Processor(s) **Quad-Core, Dual-Socket Rack-Optimized High Performance Computing Server with entry pricing**
 Up to two AMD® Opteron 2000 Series Quad Core Processors up to 2.5GHz¹ / simultaneously supports 32 and 64-bit computing
L2 cache **512KB** / per core / at processor speed
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 **2 or 8 GB** std / 24GB max¹³ per processor (48GB max per dual cpu system) / *single cpu system*: two slots used, four slots available; *dual cpu system*: four slots used, eight slots available / **PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs** / twelve DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / **Error Checking and Correcting (ECC)** via 16-bit Checksum / **Xcelerated Memory Technology™** / **Chipkill™** on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

SATA disk controller **Integrated SATA II controller** / provided by HT1000 South Bridge / two port / optional SAS / optional RAID
SATA controller/cable Two connectors on planar / two 1-drop cables / one 1-drop IDE cable (for optical drive)
Disk - capacity 80GB / 7200 rpm / 9.0ms seek
Disk - bays Two 3.5" fixed / SATA connectors / filler panels in each disk bay / supports 15k drives
Mechanical **EIA 19" Rack (1U⁴)** / 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 Dual Gigabit 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 Systems mgmt Power-on and administrator passwords / unattended boot / selectable boot
IBM Integrated Baseboard Management Controller(BMC) / H82166 / IPMI 2.0

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

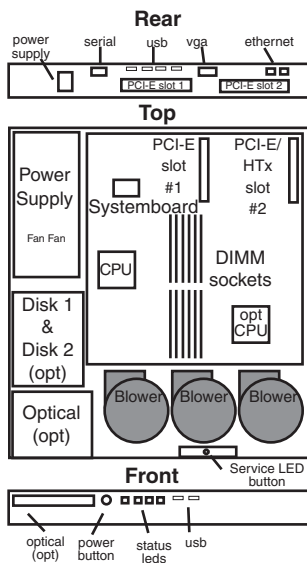
Software **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™, and others

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

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

| | |
|--|---------|
| AMD Opteron Processor Model 2352 | 43W7461 |
| AMD Opteron Processor Model 2356 | 43W7463 |
| 1GB (2x512) PC2-5300 CL5 ECC DDR2 FBDIMM | 41Y2759 |
| 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 FBDIMM | 41Y2762 |
| 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 FBDIMM | 41Y2765 |
| 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 FBDIMM | 41Y2768 |
| IBM 80GB 7.2K 3.5" SATA HDD | 39M4500 |
| IBM 160GB 7.2K 3.5" SATA HDD | 39M4504 |
| IBM 250GB 7.2K 3.5" SATA HDD | 39M4508 |
| IBM 500GB 7.2K 3.5" SATA HDD | 39M4514 |
| IBM 750GB 7.2K 3.5" SATA HDD | 43W7572 |
| IBM 73GB 10K 3.5" SAS HDD* | 40K1045 |
| IBM 146GB 10K 3.5" SAS HDD* | 40K1046 |
| IBM 300GB 10K 3.5" SAS HDD* | 40K1047 |
| IBM 73GB 15K 3.5" SAS HDD* | 40K1049 |
| IBM 146GB 15K 3.5" SAS HDD* | 40K1050 |
| IBM SAS HBA Controller | 25R8060 |
| IBM InfiniBand HTx Adapter by Q Logic | 41Y4519 |
| PCI-E x8 Riser Card | 32R3288 |
| HTx Riser Card | 40K7462 |

Other options at ibm.com/products/us



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

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

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

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

*IBM SAS HBA Controller option required for SAS support

LIMITED WARRANTY³

- ⇨ 1 year parts and labor
- ⇨ International Warranty Service³
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇨ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, NBDresponse (ServicePac® part num 46D4095)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 46D4096)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 46D4097)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 46D4098)
- ⇨ Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf
- ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

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

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

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

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

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

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

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

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

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

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

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

Disk - bays Eight hot-swap SAS/SATA bays

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

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

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

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

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

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

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

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

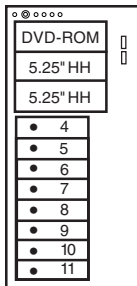
| | | | |
|--------------|---|--|---------|
| Systems mgmt | IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin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

Keyboard / mouse Optional

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

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

Tower



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

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

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

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

LIMITED WARRANTY³

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

| IBM® Type-model | Qty x Processor | L2 Core cache | Memory | Disk | Disk controller | Mechanical | Slots x bays (hot-swap bays) | Power supply | Ethernet | Available date |
|--------------------|------------------------|------------------|--------|------|--------------------|------------|---------------------------------|--------------|-----------|-------------------|
| 7977- F2x | 1 x Xeon™ E5335 2.0GHz | QC 8MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Feb 2007 |
| 7977- G2x | 1x Xeon E5345 2.33GHz | QC 8MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Feb 2007 |
| 7977- H2x | 1x Xeon E5355 2.66GHz | QC 8MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Feb 2007 |
| 7977- A2x | 1x Xeon E5405 2.0GHz | QC 12MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Jan 2008 |
| 7977- D2x | 1x Xeon E5410 2.33GHz | QC 12MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Jan 2008 |
| 7977- J2x | 1x Xeon E5420 2.5GHz | QC 12MB | 1GB | Open | SAS | Tower | 6x15 (12 HS std/max) | 1 x 835W HS | 2xGigabit | Jan 2008 |
| 7977- L2x | 1x Xeon E5430 2.66GHz | QC 12MB | 1GB | Open | SAS | Tower | 6x15 (12 HS std/max) | 1 x 835W HS | 2xGigabit | Jan 2008 |
| 7977- M2x | 1x Xeon E5440 2.83GHz | QC 12MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Jan 2008 |
| 7977- R2x | 1x Xeon E5450 3.0GHz | QC 12MB | 1GB | Open | SAS/SATA | Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2xGigabit | Jan 2008 |

Positioning Processor *Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price*
 Up to 1 x Intel® Xeon Processor up to 3.0GHz with 1333MHz FSB / 12MB L2 ECC Cache / Xeon Processor up to 2.66GHz with 1333MHz FSB / 8MB L2 ECC Cache / All Quad-Core / All EM64T

L2 cache **8 or 12MB** / std and max / at processor speed

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

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

Memory **1GB** std / 48GB¹³ 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 or 12 hot-swap SFF SAS bays

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

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

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

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

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

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

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

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

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

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

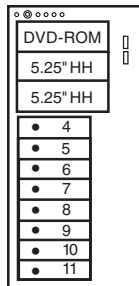
Power supply 835 watt / std/max: one/two / hot-swap / voltage-sensing / auto-restart / redundant with optional power supply

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

| | |
|---|---------|
| Xeon E5335 2.0GHz/1333MHz/8MB L2 Cache Proc Upg | 43W5823 |
| Xeon E5345 2.33GHz/1333MHz/8MB L2 Cache Proc Upg | 43W5824 |
| Xeon E5355 2.66GHz/1333MHz/8MB L2 Cache Proc Upg | 43W5825 |
| Xeon E5405 2.0GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5630 |
| Xeon E5410 2.33GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5631 |
| Xeon E5420 2.5GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5632 |
| Xeon E5430 2.66GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5633 |
| Xeon E5440 2.83GHz/1333MHz/12MB L2 Cache Proc Upg | 44R5634 |
| Xeon E5450 3.0GHz/1333MHz/12MB L2 Cache Proc Upg | 44E5122 |
| 1GB Kit (2x512MB DIMM) PC2-5300 DDR2 FBD CL4 | 39M5782 |
| 2GB Kit (2x1GB DIMM) PC2-5300 DDR2 FBD CL4 | 39M5785 |
| 4GB Kit (2x2GB DIMM) PC2-5300 DDR2 FBD CL4 | 39M5791 |
| 146GB 10K SAS Hot-Swap HDD | 40K1040 |
| 300GB 10K SAS Hot-Swap HDD | 40K1041 |
| 36GB 15K SAS Hot-Swap HDD | 40K1042 |
| 73GB 15K SAS Hot-Swap HDD | 40K1043 |
| 146GB 15K SAS Hot-Swap HDD | 40K1044 |
| 160GB 7.2K SATA Hot-Swap HDD | 39M4522 |
| 250GB 7.2K SATA Hot-Swap HDD | 39M4526 |
| 500GB 7.2K SATA Hot-Swap HDD | 39M4530 |
| IBM Remote Supervisor Adapter II Slimline | 39Y9566 |
| IBM Redundant Power and Cooling Option(NA) | 39Y8487 |

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

Tower



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

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

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

All models: Max internal disk capacity: 2.4TB² with eight 300GB 10K SAS or 6.0TB² with eight 750GB SATA hot-swap HDDs

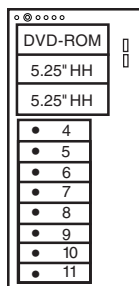
LIMITED WARRANTY³

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

| IBM® Type-model Qty x Processor | L2 Core cache Memory | Disk controller Mechanical | Slots x bays (hot-swap bays) | Power supply | Ethernet | Available date |
|---|-------------------------|-------------------------------|---------------------------------|--------------|----------|-------------------|
| 7977- Q4x 1 x Xeon™ X5460 3.16GHz QC 12MB 1GB | Open SAS/SATA Tower | 6x11 (8 HS std/max) | 1 x 835W HS | 2 x Gb | Nov 2008 | |

| | | | | | | |
|--------------------------------------|---|--|--|--|---|---------|
| Positioning Processor | <i>Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price</i> Up to 2 x Intel® Xeon Processor up to 3.16GHz with 1333MHz FSB / 12MB L2 ECC Cache / Quad-Core / All EM64T | | | | | |
| L2 cache SMP support Implementation | 12MB / std and max / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers | | | | | |
| Memory | 1GB std / 48GB ¹³ max (48GB maximum can be achieved when 4GB DIMMs are supported, 24GB is the max with less than 4GB DIMMs) / two slots used / ten slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill | | | | | |
| SAS/SATA controller | Adaptec® AIC-9580W / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1, 5 & 10 / ServeRAID 8k std | | | | | |
| SAS connectors SAS cabling | Dual channel controller wired to two hot-swap DASD backplanes 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 or 12 hot-swap SFF SAS bays | | | | | |
| Mechanical Slots (see below) Chipset | Tower / conversion to EIA 26" Rack (5U ⁴) via optional kit 39Y8382 Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O | | | | | |
| Ethernet controller | Dual 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-Express 64-bit 100MHz / full duplex / Wake on LAN® / IPMI (2.0) | | | | | |
| DVD-ROM / diskette | 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 | | | | | |
| | | | | | Xeon X5460 3.16GHz/1333MHz/12MB L2 Cache Proc Upg | 44E5635 |
| | | | | | 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 |
| | | | | | IBM Remote Supervisor Adapter II Slimline | 39Y9566 |
| | | | | | IBM Redundant Power and Cooling Option(NA) | 39Y8487 |
| | | | | | IBM ServeRAID-MR10is VAULT SAS/SATA Controller | 44E8695 |
| | Other options at www.ibm.com/pc/us/accessories | | | | | |

Tower



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

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

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

Max internal disk capacity:
6.0TB² with eight 750GB SATA hot-swap HDDs

LIMITED WARRANTY³

- ⇨ 3 year parts and labor
- ⇨ International Warranty Service³
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇨ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hour coverage, Mon-Fri excluding holidays, 4 hour average response (ServicePac® part num 43X3670)
 - 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 43X3669)
- ⇨ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type - model | Qty x Processor/ Core | L3 cache | Memory | Disk | Disk controller | Mechanical | Slots x bays (hot-swap bays) | Power supply | Ethernet | Available date | |
|----------------------|-----------------------|-------------|--------|-------|--------------------|------------|---------------------------------|-----------------|-------------|-------------------|-----------|
| 7839-12x | 1 x Xeon™ E5502 | 1.86GHz/2C | 4MB | 2x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | June 2009 |
| 7839-22x | 1 x Xeon E5504 | 2.0GHz/4C | 4MB | 2x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | June 2009 |
| 7839-32x | 1 x Xeon E5520 | 2.26GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | June 2009 |
| 7839-42x | 1 x Xeon E5530 | 2.4GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | June 2009 |
| 7839-62x | 1 x Xeon X5550 | 2.66GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | June 2009 |
| 7839-82x | 1 x Xeon X5570 | 2.93GHz/4C | 8MB | 2x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | June 2009 |
| 7839-E2x | 1 x Xeon E5530 | 2.4GHz/4C | 8MB | 6x1GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 1 x 920W HS | 2 x Gb | July 2009 |
| 7839-E4x | 2 x Xeon X5550 | 2.66GHz/4C | 8MB | 6x2GB | Open | SAS/SATA | Tower | 7x11 (8 HS std) | 2 x 920W HS | 2 x Gb | July 2009 |

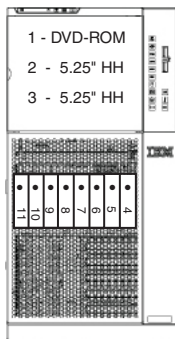
| | |
|--|--|
| Positioning Processor(s) | <i>Ultimate balance of high performance, high availability, expansion capability and ease of management in a stable, long-life platform</i> Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 1.86GHz with 4MB L3 / 4 Core / Hyper-Threading |
| L3 cache | 4 or 8MB std and max / at processor speed |
| SMP Implementation | 2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, six PCI-E slots, one PCI slot, and integrated SAS/SATA, ethernet and graphics controllers |
| Memory | 2GB std / 64GB max per processor(using 8GB DIMMs*) / PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring |
| Disk Controller | LSI Logic® 1068 SAS/SATA controller / up to eight port / on riser card / PCI-Express / supports RAID-0/1/1E / upgradeable to LSI 1078 (RAID-0/1/5/6/10/50/60) / optional battery backed cache |
| Disk bays | Eight 2.5-inch Small Form Factor (SFF) hot swap disk bays std / up to sixteen via CTO / supports SAS, SATA or SSD SFF HS disks |
| Mechanical Architecture/Chipset | Tower / conversion to EIA 26" Rack (5U ⁴) via CTO Intel 5500 Chipset / Intel IO Hub provides PCI-Express slots 1-5 and links to BCM5709C, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O, PCI-Express slot 6 and a PCI slot |
| BUS slots | (See below) One PCI-Express 2nd Gen x16 slot / Four PCI-Express 2nd Gen x8 slots(one reserved for SAS controller) / One PCI-Express 1st Gen x8 slot / One 32-bit 33MHz PCI 2.2 slot |
| Ethernet | Two Gigabit Ethernet ports / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing |
| Optical / diskette Front & Rear ports Graphics | 16X⁶ DVD-ROM / SATA / USB diskette only <i>Front:</i> two USB (2.0) / <i>Rear:</i> four USB (2.0), serial (9-pin), graphics (DB-15), three RJ-45 (2 enet, 1 sys mgmt) SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / 32-bit 33MHz PCI 2.2 |
| Systems Mgmt | Integrated Management Module (IMM) / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / Remote Presence, blue screen capture via IBM Virtual Media Key std |
| Diagnostics Security | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics via preboot DSA Power-on password / administrator password / unattended boot / selectable boot / unattended start mode |

| | | |
|------------------|---|--|
| Publications | Installation Guide and Documentation CD | |
| Keyboard / mouse | Standard / USB only | |
| Power supply(s) | <i>Std/Max:</i> one/two 920 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing | |
| Cooling | Calibrated Vectored Cooling™ <i>Std/Max:</i> three / hot-swap | |
| Prerequisites | redundant / variable speed / / PFA Monitor, SAS/SATA disk, rack, OS | |

| | |
|---|---------|
| Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache | 46D1350 |
| Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache | 46D1351 |
| Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache | 46D1352 |
| Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache | 46D1353 |
| Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache | 46D1355 |
| Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache | 46D1357 |
| 1x1GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1480 |
| 1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1481 |
| 1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1482 |
| 1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1483 |
| 920 Watt Hot-swap Power Supply Option (US) | 44X0381 |
| IBM ServeRAID-BR10i SAS/SATA Controller | 44E8689 |
| IBM ServeRAID-MR10i SAS/SATA Controller | 43W4296 |
| 73GB 15K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 42D0672 |
| 146GB 15K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 42D0677 |
| 146GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 42D0632 |
| 300GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 42D0637 |

Other options at ibm.com/products/us

Tower



- 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 8.5" x D 27.6"
- 44 to 84 pounds
- Stealth black color

- 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 2.5", SFF .5" access, hot-swap
- Bay 5 2.5", SFF .5" access, hot-swap
- Bay 6 2.5", SFF .5" access, hot-swap
- Bay 7 2.5", SFF .5" access, hot-swap
- Bay 8 2.5", SFF .5" access, hot-swap
- Bay 9 2.5", SFF .5" access, hot-swap
- Bay 10 2.5", SFF .5" access, hot-swap
- Bay 11 2.5", SFF .5" access, hot-swap

- Slot 1: half-length, PCI-Express x8(x8 electrical)
- Slot 2: full, PCI-Express x16 (x8 electrical)
- Slot 3: full, PCI-Express x8 (x4 electrical)
- Slot 4: full, PCI-Express x8 (x4 electrical)
- Slot 5: full, PCI-Express x8 (x8 electrical)
- Slot 6: half-length, 32-bit 33MHz 5.0v PCI
- Slot 7: full, PCI-Express x8 (x4 electrical)

Max internal disk capacity:
2.4TB² with eight 300GB SAS hot-swap HDDs

LIMITED WARRANTY³

- ⇒ 3 year parts and labor
- ⇒ International Warranty Service³
- ⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⇒ 3 year on site warranty service upgrade options (in eligible locations):⁷
- ⇒ 9 hour coverage, Mon-Fri excluding holidays, 4 hour avg response (ServicePac® part num 68Y5547)
- ⇒ 24/7 day coverage, 4 hour avg response (ServicePac part number 68Y5548)
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

• = Hot-swap
* = 8GB dimms planned availability: June 2009

| 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 2.5) | SAS/SATA Combo | 670W | 4 hot-swap | 2x4 | 2 x GB | 3 year Aug | 2006 | |
| 7978-71y-71x | 1 x Xeon 5160 3.0GHz/DC | 4MB 1GB | (open 3.5) | SAS/SATA Combo | 670W | 2 hot-swap | 2x4 | 2 x GB | 3 year Aug | 2006 | |
| 7978-7Ay-7Ax | 1 x Xeon 5160 3.0GHz/DC | 4MB 1GB | (open 2.5) | SAS/SATA Combo | 670W | 4 hot-swap | 2x4 | 2 x GB | 3 year Aug | 2006 | |

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

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

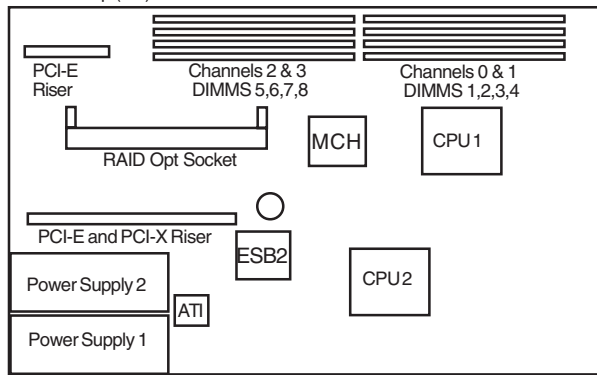
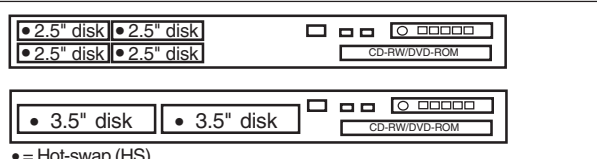
SAS/SATA controller
Adaptec® AIC-9580W / dual channel SAS controller / four port SAS or two port SATA (300MB/sec SAS) (150MB/sec SATA) / on planar / PCI-Express / some: hot-swap, supports **RAID 0, 1, &10** ; some: simple swap, supports **HostRAID** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID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

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

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

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

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



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

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

See footnotes for important warranty information

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

LIMITED WARRANTY³

- ⊘ 3 year parts and labor
- ⊘ International Warranty Service³
- ⊘ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⊘ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac21P2173)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac21P2074)
- ⊘ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊘ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-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-BAX | 1 x Xeon™ E5405 2.0GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Jan 2008 |
| 7978-B1x | 1 x Xeon E5405 2.0GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Jan 2008 |
| 7978-BCx | 1 x Xeon E5420 2.5GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Jan 2008 |
| 7978-B3x | 1 x Xeon E5420 2.5GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Jan 2008 |
| 7978-BDx | 1 x Xeon E5430 2.66GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Jan 2008 |
| 7978-B4x | 1 x Xeon E5430 2.66GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Jan 2008 |

Positioning Processor *A highly manageable, ultra-dense 1U, dual-socket server providing performance computing in space-constrained environments*
Up to 2 x Intel® Xeon Processor 3.16GHz with 1333MHz FSB / 12MB L2 ECC Cache / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST)
12 MB / std and max / at processor speed
SMP support Implementation **2-way SMP / up to two Xeon Processors (same speed/cache size)**
 Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory **2GB (2x1GB) std / 32GB¹³ max / two slots used / six slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill**

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

SAS connectors One internal connection wired to DASH backplane
IDE controller/cable Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM)
Disk - capacity None standard / supports 7200-15000 rpm disks / one backplane
Disk - bays Some: two hot-swap 3.5" SAS HDD / some: four hot-swap 2.5" SAS HDD / some: two simple swap 3.5" SATA HDD / filler panels installed in each disk bay

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

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

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

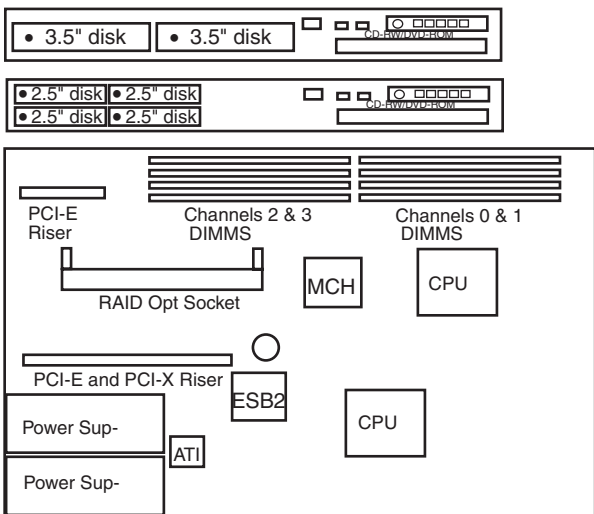
Optical / diskette Front & Rear ports **8X-24X⁶ CD-RW/DVD-ROM / USB only**
Front: two USB (Vers 2.0), graphics (DB-15) **Rear:** two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

Graphics SVGA / ATI⁹ RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

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

| | | | |
|-------------------------|--|---|---------|
| Diagnostics | Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel) | Xeon E5405 2.0GHz/1333MHz/12MB L2 Cache | 44E5074 |
| Software | ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others | Xeon E5420 2.5GHz/1333MHz/12MB L2 Cache | 44E5076 |
| Keyboard / mouse | None standard (because rack-based) / USB only | Xeon E5430 2.66GHz/1333MHz/12MB L2 Cache | 44E5077 |
| Power supply | Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing | 1GB PC2-5300 FBD (2 x 512MB) | 39M5782 |
| Fans | Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA | 2GB PC2-5300 FBD (2 x 1GB) | 39M5785 |
| Prerequisites | Monitor, keyboard, mouse, SAS/SATA disk, rack, OS | 4GB PC2-5300 FBD (2 x 2GB) | 39M5791 |
| | | 8GB PC2-5300 FBD (2 x 4GB) | 39M5797 |
| | | IBM ServeRAID-8k Adaptor | 25R8064 |
| | | IBM Remote Supervisor Adapter II Slim | 39Y9566 |
| | | 250GB 7.2K rpm SATA II hot-swap | 39M4526 |
| | | 500GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4530 |
| | | 750GB 7.2K rpm SATA hot-swap 300MB/sec | 43W7576 |
| | | 1TB 7.2K rpm SATA hot-swap 300MB/sec | 43W7676 |
| | | 300GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 43X0802 |
| | | 73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 40K1052 |
| | | 146GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0824 |
| | | 73.4GB 15K-rpm SAS SF HS 2.5" (SFF tray) HDD | 43X0837 |
| | | 73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1043 |
| | | 146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1044 |
| | | 670 Watt Hot-swap Power Supply Option (US) | 32R2815 |
| | | PCI Riser Card PCI-X Option | 32R8216 |

Other options at ibm.com/products/us



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

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

See footnotes for important warranty information

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

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2173)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2074)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty

| IBM® Type-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-BEx | 1 x Xeon™ E5440 2.8GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Jan 2008 |
| 7978-B5x | 1 x Xeon E5440 2.8GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Jan 2008 |
| 7978-BJx | 1 x Xeon X5450 3.0GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Jan 2008 |
| 7978-B9x | 1 x Xeon X5450 3.0GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Jan 2008 |
| 7978-BGx | 1 x Xeon X5460 3.16GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Jan 2008 |
| 7978-B7x | 1 x Xeon X5460 3.16GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Jan 2008 |

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Up to 2 x Intel® Xeon Processor 3.16GHz with 1333MHz FSB / 12MB L2 ECC Cache / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST)
12 MB / std and max / at processor speed
SMP support Implementation **2-way SMP / up to two Xeon Processors (same speed/cache size)**
 Systemboard contains two Intel LGA771 sockets, eight memory gold-connector DIMM slots, two PCI-E slots or one PCI-E slot and one PCI-X slot, integrated SAS or SATA, ethernet and graphics controllers

Memory **2GB (2x1GB) std / 32GB¹³ max / two slots used / six slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill**

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

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

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

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

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

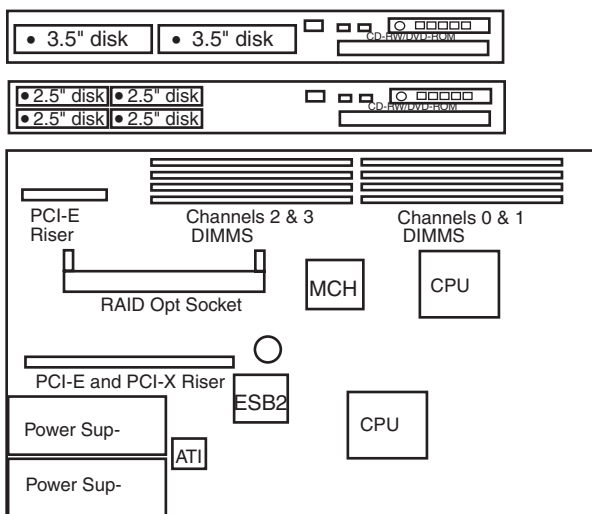
Optical / diskette Front & Rear ports 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front: two USB (Vers 2.0), graphics (DB-15) **Rear:** two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

Graphics SVGA / ATI⁹ RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

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

| | | | |
|-------------------------|--|---|---------|
| Diagnostics | Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel) | Xeon E5440 2.83GHz/1333MHz/12MB L2 Cache | 44E5078 |
| Software | ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others | Xeon X5450 3.0GHz/1333MHz/12MB L2 Cache | 44E5121 |
| Keyboard / mouse | None standard (because rack-based) / USB only | Xeon X5460 3.16GHz/1333MHz/12MB L2 Cache | 44E5080 |
| Power supply | Std/Max: one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing | 1GB PC2-5300 FBD (2 x 512MB) | 39M5782 |
| Fans | Calibrated Vectored Cooling™ Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA | 2GB PC2-5300 FBD (2 x 1GB) | 39M5785 |
| Prerequisites | Monitor, keyboard, mouse, SAS/SATA disk, rack, OS | 4GB PC2-5300 FBD (2 x 2GB) | 39M5791 |
| | | 8GB PC2-5300 FBD (2 x 4GB) | 39M5797 |
| | | IBM ServeRAID-8k Adaptor | 25R8064 |
| | | IBM Remote Supervisor Adapter II Slim | 39Y9566 |
| | | 250GB 7.2K rpm SATA II hot-swap | 39M4526 |
| | | 500GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4530 |
| | | 750GB 7.2K rpm SATA hot-swap 300MB/sec | 43W7576 |
| | | 1TB 7.2K rpm SATA hot-swap 300MB/sec | 43W7676 |
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| | | 146GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0824 |
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| | | 73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1043 |
| | | 146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1044 |
| | | 670 Watt Hot-swap Power Supply Option (US) | 32R2815 |
| | | PCI Riser Card PCI-X Option | 32R8216 |

Other options at ibm.com/products/us



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

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

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

LIMITED WARRANTY³

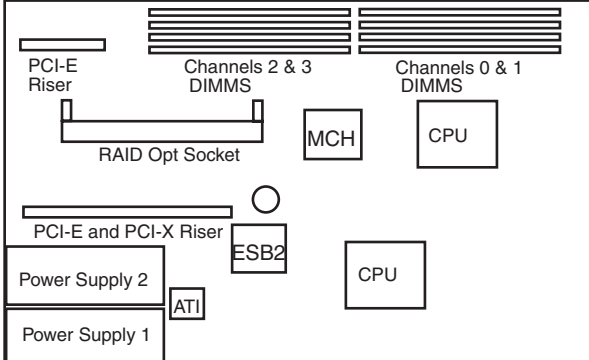
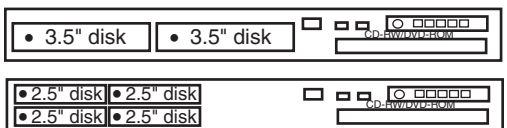
- ~ 3 year parts and labor
- ~ International Warranty Service³
- ~ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ~ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2172)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2173)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2074)
- ~ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ~ 24x7¹⁴ toll-free support for warranty

See footnotes for important warranty information

| IBM® Type-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 |
|-----------------|---------------------------|----------|--------|------------|-----------------|---------|--------------|------------|--------------|----------|-------------------------------|----------------|
| 7978-82x | 1 x Xeon™ X5470 3.3GHz/QC | 12MB | 2GB | (open 3.5) | SAS/SATA | Combo | 1x670W | 2 hot-swap | 2x2 | 2 x GB | 3 year | Sep 2008 |
| 7978-8Bx | 1 x Xeon X5470 3.3GHz/QC | 12MB | 2GB | (open 2.5) | SAS | Combo | 1x670W | 4 hot-swap | 2x4 | 2 x GB | 3 year | Sep 2008 |

| | |
|-----------------------|---|
| Positioning Processor | <i>A highly manageable, ultra-dense 1U, dual-socket server providing performance computing in space-constrained environments</i> Up to 2 x Intel® Xeon Processor 3.3GHz with 1333MHz FSB / 12MB L2 ECC Cache / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST) 12 MB / std and max / at processor speed |
| L2 cache | 2-way SMP / up to two Xeon Processors (same speed/cache size) |
| SMP support | 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 |
| Implementation | |
| Memory | 2GB (2x1GB) 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 (1U⁴) / 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 | <i>Front:</i> two USB (Vers 2.0), graphics (DB-15) <i>Rear:</i> two 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) |

| | | | |
|------------------|--|---|---------|
| Diagnosics | Drop down Light Path Diagnostics panel providing LED map to failing part (located on front panel) | Xeon X5470 3.3GHz/1333MHz/12MB L2 Cache | 46M1031 |
| Software | ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others | 1GB PC2-5300 FBD (2 x 512MB) | 39M5782 |
| Keyboard / mouse | None standard (because rack-based) / USB only | 2GB PC2-5300 FBD (2 x 1GB) | 39M5785 |
| Power supply | <i>Std/Max:</i> one/two 670 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing | 4GB PC2-5300 FBD (2 x 2GB) | 39M5791 |
| Fans | Calibrated Vectored Cooling™ <i>Std:</i> ten fans; <i>Max:</i> twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA | 8GB PC2-5300 FBD (2 x 4GB) | 39M5797 |
| Prerequisites | Monitor, keyboard, mouse, SAS/SATA disk, rack, OS | IBM ServeRAID-8k Adapter | 25R8064 |



- ⊗ 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

| | |
|---|---------|
| 250GB 7.2K rpm SATA II hot-swap | 39Y9566 |
| 500GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4526 |
| 750GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4530 |
| 1TB 7.2K rpm SATA hot-swap 300MB/sec | 43W0756 |
| 300GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 43W0766 |
| 73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0802 |
| 146GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 40K1052 |
| 73.4GB 15K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0824 |
| 73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 43X0837 |
| 146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1043 |
| 670 Watt Hot-swap Power Supply Option (US) | 40K1044 |
| PCI Riser Card PCI-X Option | 32R2815 |
| | 32R8216 |

Other options at ibm.com/products/us

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr avg response time (ServicePac[®] 12X6610)
 - 24 hr x 7 day coverage, 4 hr avg response time (ServicePac 12X6611)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxexu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

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

Max internal disk capacity:
 2.5": SAS models: 594GB² with four 146GB SFF disks
 3.5" SATA models: 1.5TB² with two 750GB disks

See footnotes for important warranty information

| IBM® Type-model | Qty x Processor/Core | L3 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------------|--------|-------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7946-12x | 1 x Xeon® | E5502 1.86GHz/2C | 4MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-22x | 1 x Xeon | E5504 2.0GHz/4C | 4MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-3Ax | 1 x Xeon | E5506 2.13GHz/4C | 4MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-32x | 1 x Xeon | E5520 2.26GHz/4C | 8MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-42x | 1 x Xeon | L5520 2.26GHz/4C | 8MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-52x | 1 x Xeon | E5530 2.4GHz/4C | 8MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-62x | 1 x Xeon | E5540 2.53GHz/4C | 8MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-92x | 1 x Xeon | X5570 2.93GHz/4C | 8MB | 2x1GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-E1x | 1 x Xeon | E5502 1.86GHz/2C | 4MB | 2x2GB | open 2.5 | SAS/SATA | Combo | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-E2x | 1 x Xeon | E5530 2.4GHz/4C | 8MB | 2x2GB | open 2.5 | SAS/SATA | Combo | 2x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |
| 7946-E3x | 1 x Xeon | X5560 2.8GHz/4C | 8MB | 4x2GB | open 2.5 | SAS/SATA | Combo | 2x675W | 6 hot-swap | 2x7 | 2 x Gb | Apr 2009 |

Positioning Processor(s) *Business critical compact application server to significantly reduce total cost of ownership packed with IBM innovation*
Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 2.13GHz with 4MB L3 / 2 or 4 Core / with Hyper-Threading
 L3 cache **4 or 8MB** std and max / at processor speed
 SMP **2-way SMP** / up to two Xeon Processors (same speed/cache size)
 Implementation Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, two PCI-E slots, integrated SAS, ethernet and graphics controllers

Memory **2 or 4GB std / 64GB max per processor(using 8GB DIMMs**)** / **PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs** / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring

Disk Controller **LSI Logic® 1068 SAS/SATA controller / up to eight port / on riser card / PCI-Express / supports RAID-0/1/1E / upgradeable to LSI 1078(RAID-0/1/5/6/10/50/60) / optional battery backed cache / SATA controller integrated into ICH10**
 Disk bays **Six 2.5-inch Small Form Factor (SFF) hot swap disk bays std / supports SAS, SATA or SSD SFF hot swap disks**
 Flash Storage **USB-based slot on SAS riser card for optional Hypervisor USB key**

Mechanical Architecture/Chipset **EIA 19" Rack (1U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel 5520 Chipset / Intel IO Hub provides PCI-Express slots and links to BCM5709, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O**
 BUS slots (See below) **Two second-generation PCI-Express x16 slots / both slots convertible via riser to PCI-X**

Ethernet **Two Gigabit Ethernet ports / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / upgradeable to four Ethernet ports with additional Broadcom 5709 daughter card**

Optical / diskette Front & Rear ports **8X-24X⁶ CD-RW/DVD-ROM / USB only**
 Front: two USB (Vers 2.0), graphics (DB-15) Rear: two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
 Graphics **SVGA / Matrox G200eV integrated in IMM on systemboard / 8MB DDR2-250MHz SDRAM std/max**

Systems Mgmt **Integrated Management Module (IMM) / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key**

Diagnostics Security **Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics**
 Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

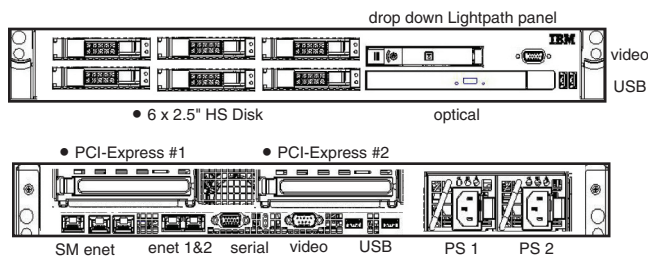
Publications **Installation Guide and Documentation CD**
 Keyboard / mouse **None standard (because rack-based) / USB only**
 Power supply(s) **Std/Max: one or two/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing**

Cooling **Calibrated Vektored Cooling™ Std/Max: six / hot-swap redundant / variable speed / PFA**
 Prerequisites **Monitor, keyboard, mouse, SAS/SATA disk, rack, OS**

| | |
|--|---------|
| Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache | 46M1077 |
| Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache | 46M1078 |
| Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache | 46M1079 |
| Xeon L5506 2.13GHz/4.8GTs/4MB L3 Cache | 46M1082 |
| Xeon L5520 2.26GHz/5.86GTs/8MB L3 Cache | 46M1080 |
| Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache | 46M1081 |
| Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache | 46M1083 |
| Xeon E5540 2.53GHz/5.86GTs/8MB L3 Cache | 46M1084 |
| Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache | 46M1085 |
| Xeon X5560 2.8GHz/6.4GTs/8MB L3 Cache | 46M1086 |
| Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache | 46M1087 |
| 1x1GB (1Rx8) PC3-10600 ECC DDR3 RDIMM | 44T1480 |
| 1x2GB (2Rx8) PC3-10600 ECC DDR3 RDIMM | 44T1481 |
| 1x2GB (1Rx4) PC3-10600 ECC DDR3 Chipkill RDIMM | 44T1482 |
| 1x4GB (2Rx4) PC3-10600 ECC DDR3 Chipkill RDIMM | 44T1483 |
| IBM Virtual Media key | 46C7526 |
| PCI-X Riser card | 46M1071 |
| Dual-port 1 Gb Ethernet Daughter card | 46M1076 |
| 675 Watt Hot-swap Power Supply Option (US) | 46M1075 |
| IBM ServeRAID-MR10i SAS/SATA Controller | 43W4296 |
| 73.4GB 10K-rpm SAS SFF Slim-HS 2.5" HDD | 43W7535 |
| 146GB 10K-rpm SAS SFF Slim-HS 2.5" HDD | 43W7536 |

Other options at ibm.com/products/us

1U Rack with 2.5" HS SAS



Slot 1*:PCI-Express x16 low profile
 Slot 2*:PCI-Express x16 full height, half length
 *slots convertible to 64-bit 1333MHz 3.3v PCI-X via riser card
 Max internal disk capacity:
 2.5": SAS models: 1.8TB² with six 300GB SFF disks

- ↳ Quick release adapter slots (no screws)
- ↳ Configuration/Setup Utility: F1 at startup
- ↳ Diagnostics (preboot DSA): 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, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- ↳ Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
- ↳ 28 to 35.5 pounds
- ↳ Stealth black color

LIMITED WARRANTY³

- ↳ 3 year parts and labor
- ↳ International Warranty Service³—On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, nbd response time⁷
- ↳ 3 year on site warranty service upgrade options (in eligible locations):⁷ 9 hr coverage, Mon-Fri excluding holidays, 4 hr avg response time (ServicePac³ 65Y214)
- ↳ 24 hr x 7 day coverage, 4 hr avg response time (ServicePac 65Y215)
- ↳ 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

** = 8GB dimms planned availability: June 2009

| IBM® Type-model | Qty x Processor/Core | L3 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------|--------|-------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7946-74x | 1 x Xeon® X5550 | 2.66GHz/4C | 8MB | 1x4GB | open 2.5 | SAS/SATA | open | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Oct 2009 |
| 7946-94x | 1 x Xeon® X5570 | 2.93GHz/4C | 8MB | 1x4GB | open 2.5 | SAS/SATA | open | 1x675W | 6 hot-swap | 2x7 | 2 x Gb | Oct 2009 |

Positioning Processor(s) **Business critical compact application server to significantly reduce total cost of ownership packed with IBM innovation Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading**

L3 cache **8MB** std and max / at processor speed
 SMP **2-way SMP** / up to two Xeon Processors (same speed/cache size)
 Implementation Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, two PCI-E slots, integrated SAS, ethernet and graphics controllers

Memory **4GB std / 64GB max** per processor(using 8GB DIMMs) / **PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs** / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring

Disk Controller **IBM ServeRAID 5015 SAS/SATA controller** / up to eight 6Gb/s ports / on riser card / PCI-Express / supports **RAID-0/1/5/6/10/50/60** / battery backed cache / SATA controller for optional optical integrated into ICH10
 Disk bays **Six 2.5-inch Small Form Factor (SFF)** hot swap disk bays std / supports SAS, SATA or SSD SFF hot swap disks
 Flash Storage **USB-based slot on SAS riser card** for optional Hypervisor USB key

Mechanical Architecture/Chipset **EIA 19" Rack (1U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5520 Chipset / Intel IO Hub provides PCI-Express slots and links to BCM5709, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O
 BUS slots (See below) **Two second-generation PCI-Express x16 slots** / both slots convertible via riser to PCI-X

Ethernet **Two Gigabit Ethernet ports** / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / upgradeable to four Ethernet ports with additional Broadcom 5709 daughter card

Optical / diskette Front & Rear ports **Optional optical / USB only**
Front: two USB (Vers 2.0), graphics (DB-15) **Rear:** two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
 Graphics **SVGA / Matrox G200eV** integrated in IMM on systemboard / 8MB DDR2-250MHz SDRAM std/max

Systems Mgmt **Integrated Management Module (IMM)** / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key

Diagnostics Security **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics
 Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Publications **Installation Guide and Documentation CD**
 Keyboard / mouse **None standard** (because rack-based) / USB only

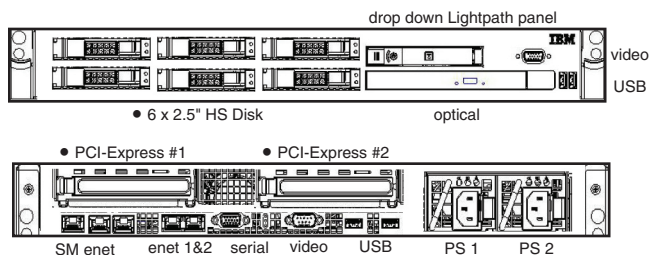
Power supply(s) **Std/Max:** one or two/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Cooling **Calibrated Vecteded Cooling™ Std/Max:** six / hot-swap redundant / variable speed / PFA

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

| | |
|--|---------|
| Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache | 46M1085 |
| Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache | 46M1087 |
| 1x1GB (1Rx8) PC3-10600 ECC DDR3 RDIMM | 44T1480 |
| 1x2GB (2Rx8) PC3-10600 ECC DDR3 RDIMM | 44T1481 |
| 1x2GB (1Rx4) PC3-10600 ECC DDR3 Chipkill RDIMM | 44T1482 |
| 1x4GB (2Rx4) PC3-10600 ECC DDR3 Chipkill RDIMM | 44T1483 |
| 1x8GB (1Rx8) PC3-10600 ECC DDR3 Chipkill RDIMM | 46C7449 |
| IBM Virtual Media key | 46C7526 |
| PCI-X Riser card | 46M1071 |
| Dual-port 1 Gb Ethernet Daughter card | 46M1076 |
| 675 Watt Hot-swap Power Supply Option (US) | 46M1075 |
| 73.4GB 10K-rpm SAS SFF Slim-HS 2.5" HDD | 43W7535 |
| 146GB 10K-rpm SAS SFF Slim-HS 2.5" HDD | 43W7536 |
| 500GB 7200-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 42D0707 |
| UltraSlim Enhanced SATA CD-RW/DVD-ROM Combo | 46M0901 |
| UltraSlim Enhanced SATA Multi-Burner | 46M0902 |

1U Rack with 2.5" HS SAS



Other options at ibm.com/products/us

- Slot 1*:PCI-Express x16 low profile
- Slot 2*:PCI-Express x16 full height, half length
- *slots convertible to 64-bit 133MHz 3.3v PCI-X via riser card
- Max internal disk capacity:
2.5": SAS models: 3TB² with six 500GB SFF disks

- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (preboot DSA): 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, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Rack: H 1.75" x W 17.3" x D 27.5" (H 43mm x W 440mm x D 711.4mm)
- 28 to 35.5 pounds
- Stealth black color

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, nbd response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷ 9 hr coverage, Mon-Fri excluding holidays, 4 hr avg response time (ServicePac® 65Y214)
- 24 hr x 7 day coverage, 4 hr avg response time (ServicePac 65Y215)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

| IBM® Type-GAV-model | Qty x Processor | L2 Core cache | Memory | Disk | Disk controller | 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 | Rack | 4x7 (4 or 6 hot-swap) | 1 x 835W Hot-Swap | 2xGigabit | July 2006 |
| 7979-5Ay-5Ax | 1 x Xeon 5140 2.33GHz | DC 4MB | 1GB | None | SAS | Rack | 4x10 (8 hot-swap) | 1 x 835W Hot-Swap | 2xGigabit | July 2006 |
| 7979-61y-61x | 1 x Xeon 5150 2.66GHz | DC 4MB | 1GB | None | SAS | Rack | 4x7 (4 or 6 hot-swap) | 1 x 835W Hot-Swap | 2xGigabit | July 2006 |
| 7979-6Ay-6Ax | 1 x Xeon 5150 2.66GHz | DC 4MB | 1GB | None | SAS | Rack | 4x10 (8 hot-swap) | 1 x 835W Hot-Swap | 2xGigabit | July 2006 |
| 7979-71y-71x | 1 x Xeon 5160 3.0GHz | DC 4MB | 1GB | None | SAS | Rack | 4x7 (4 or 6 hot-swap) | 1 x 835W Hot-Swap | 2xGigabit | July 2006 |
| 7979-7Ay-7Ax | 1 x Xeon 5160 3.0GHz | DC 4MB | 1GB | None | SAS | Rack | 4x10 (8 hot-swap) | 1 x 835W Hot-Swap | 2xGigabit | July 2006 |

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

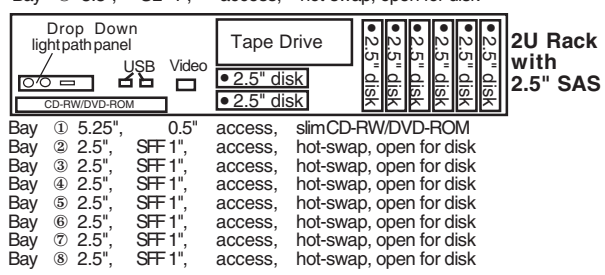
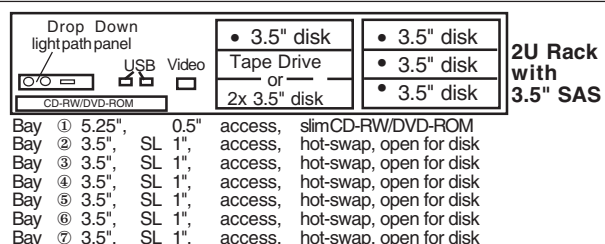
Ethernet controller Dual gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette 8X-24X⁶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

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

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

| | |
|---|---------|
| 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 | 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 |
| PCI Riser Card PCI-Express Option | 40K1907 |
| PCI Riser Card PCI-X Option | 40K1908 |

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



• = 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

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

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxue.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Qty x Processor/Core | L2 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------|--------|------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7979-BAX | 1 x Xeon™ E5405 | 2.0GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Jan 2008 |
| 7979-B1x | 1 x Xeon E5405 | 2.0GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Jan 2008 |
| 7979-BCx | 1 x Xeon E5420 | 2.5GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Jan 2008 |
| 7979-B3x | 1 x Xeon E5420 | 2.5GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Jan 2008 |
| 7979-BDx | 1 x Xeon E5430 | 2.66GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Jan 2008 |
| 7979-B4x | 1 x Xeon E5430 | 2.66GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Jan 2008 |

Positioning 2U Rack with high availability, scalability and expandability for application-serving Web environments
Processor Up to 2 x Intel® Xeon Processor 3.16GHz with 1333MHz FSB / Quad-Core / **Extended Memory 64 Technology (EM64T)** / Enhanced Intel Speedstep Technology (EIST)
L2 cache 12MB / std and max / at processor speed
SMP support 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers

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

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

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

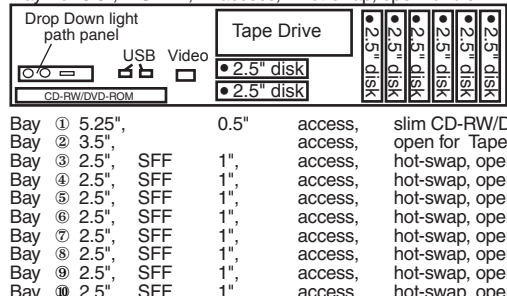
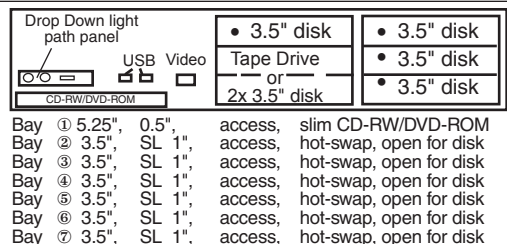
Ethernet controller Dual gigabit 10/100/1000 ethernet ports / **Two Broadcom® 5708** / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear
Optical / diskette 8X-24X⁶ CD-RW/DVD-ROM / USB only
Front & Rear ports *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* two 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 (iBMC)** / 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 E5405 2.0GHz/1333MHz/12MB L2 Cache | 44R5630 |
| Xeon E5420 2.5GHz/1333MHz/12MB L2 Cache | 44R5632 |
| Xeon E5430 2.66GHz/1333MHz/12MB L2 Cache | 44E5077 |
| 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) | 39M5797 |
| IBM ServeRAID-8k Adapter | 25R8064 |
| IBM Remote Supervisor Adapter II Slim | 39Y9566 |
| 250GB 7.2K rpm SATA II hot-swap | 39M4526 |
| 500GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4530 |
| 750GB 7.2K rpm SATA hot-swap 300MB/sec | 43W5756 |
| 1TB 7.2K rpm SATA hot-swap 300MB/sec | 43W7676 |
| 300GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 43X0802 |
| 73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 40K1052 |
| 146GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0824 |
| 73.4GB 15K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0837 |
| 73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1043 |
| 146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1044 |
| 835 Watt Hot-swap Power Supply Option (US) | 40K1905 |
| PCI Riser Card PCI-X Option | 40K1908 |

Other options at ibm.com/products/us



Bay ① 5.25", 0.5", access, slim CD-RW/DVD-ROM
 Bay ② 3.5", SL 1", access, open for Tape Drive
 Bay ③ 3.5", SL 1", access, hot-swap, open for disk
 Bay ④ 3.5", SL 1", access, hot-swap, open for disk
 Bay ⑤ 3.5", SL 1", access, hot-swap, open for disk
 Bay ⑥ 3.5", SL 1", access, hot-swap, open for disk
 Bay ⑦ 3.5", SL 1", access, hot-swap, open for disk
 Bay ⑧ 3.5", SL 1", access, hot-swap, open for disk

Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 1333MHz 3.3v PCI-X
 Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 1333MHz 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

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

LIMITED WARRANTY³

- ↳ 3 year parts and labor
- ↳ International Warranty Service³
- ↳ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↳ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac³ 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- ↳ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↳ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

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

See footnotes for important warranty information

| IBM® Type-model | Qty x Processor/Core | L2 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------|--------|------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7979-BEx | 1 x Xeon™ E5440 | 2.83GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Jan 2008 |
| 7979-B5x | 1 x Xeon E5440 | 2.83GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Jan 2008 |
| 7979-BFx | 1 x Xeon X5450 | 3.0GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Jan 2008 |
| 7979-B6x | 1 x Xeon X5450 | 3.0GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Jan 2008 |
| 7979-BGx | 1 x Xeon X5460 | 3.16GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Jan 2008 |
| 7979-B7x | 1 x Xeon X5460 | 3.16GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Jan 2008 |

Positioning Processor 2U Rack with high availability, scalability and expandability for application-serving Web environments
Up to 2 x Intel® Xeon Processor 3.16GHz with 1333MHz FSB / Quad-Core / **Extended Memory 64 Technology (EM64T)** / Enhanced Intel Speedstep Technology (EIST)

L2 cache 12MB / std and max / at processor speed

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

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

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

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

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

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

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

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

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

Mechanical Chipset **EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/1333MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O

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

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

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

Front & Rear ports *Front:* two USB (Vers 2.0), graphics (DB-15) *Rear:* two 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

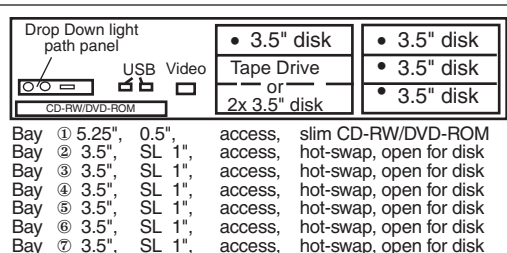
Power supply *Std/Max:* one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Fans **Calibrated Vektored 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 E5440 2.83GHz/1333MHz/12MB L2 Cache | 44R5634 |
| Xeon X5450 3.0GHz/1333MHz/12MB L2 Cache | 44E5122 |
| Xeon X5460 3.16GHz/1333MHz/12MB L2 Cache | 44E5057 |
| 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) | 39M5797 |
| IBM ServeRAID-8k Adapter | 25R8064 |
| IBM Remote Supervisor Adapter II Slim | 39Y9566 |
| 250GB 7.2K rpm SATA II hot-swap | 39M4526 |
| 500GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4530 |
| 750GB 7.2K rpm SATA hot-swap 300MB/sec | 43W5756 |
| 1TB 7.2K rpm SATA hot-swap 300MB/sec | 43W7676 |
| 300GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 43X0802 |
| 73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 40K1052 |
| 146GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0824 |
| 73.4GB 15K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0837 |
| 73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1043 |
| 146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1044 |
| 835 Watt Hot-swap Power Supply Option (US) | 40K1905 |
| PCI Riser Card PCI-X Option | 40K1908 |

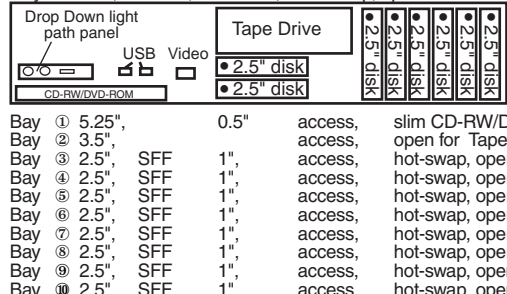
Other options at ibm.com/products/us



2U Rack with 3.5" SAS

• = Hot-swap (HS)

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



2U Rack with 2.5" SAS

• = Hot-swap (HS)

Bay ① 5.25", 0.5" access, slim CD-RW/DVD-ROM
 Bay ② 3.5", 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

Slot 1*: PCI-Express x8(x8 Links) or full length 64-bit 1333MHz 3.3v PCI-X
 Slot 2*: PCI-Express x8(x8 Links) or half length 64-bit 1333MHz 3.3v PCI-X
 Slot 3: low-profile, PCI-Express x8(x4 Links)
 Slot 4: low-profile, PCI-Express x8(x4 Links)
 *slots 1 & 2 riser determines PCI-Express or PCI-X

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

See footnotes for important warranty information

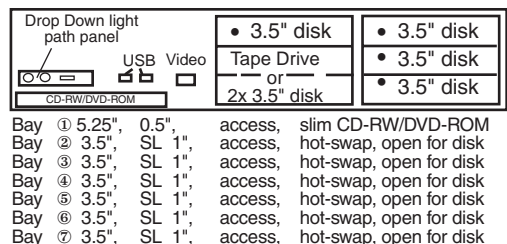
LIMITED WARRANTY³

- ↪ 3 year parts and labor
- ↪ International Warranty Service³
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↪ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- ↪ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxw.pdf>
- ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

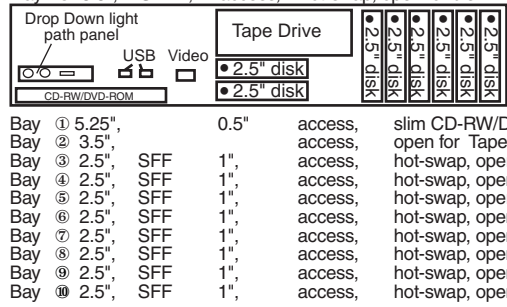
| IBM® Type-model | Qty x Processor/Core | L2 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date |
|-----------------|---------------------------|----------|--------|-----------|-----------------|---------|--------------|------------|--------------|----------|----------------|
| 7979-82x | 1 x Xeon™ X5470 3.3GHz/QC | 12MB | 2GB | 3.5" Open | SAS/SATA | Combo | 1 x 835W | 6 hot-swap | 4x6 | 2 x GB | Nov 2008 |
| 7979-8Bx | 1 x Xeon X5470 3.3GHz/QC | 12MB | 2GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Nov 2008 |
| 7979-EFU | 1 x Xeon L5430 2.66GHz/QC | 12MB | 4GB | 2.5" Open | SAS | Combo | 1 x 835W | 8 hot-swap | 4x8 | 2 x GB | Dec 2008 |

| | |
|-----------------------|--|
| Positioning Processor | 2U Rack with high availability, scalability and expandability for application-serving Web environments Up to 2 x Intel® Xeon Processor 3.3GHz with 1333MHz FSB / Quad-Core / Extended Memory 64 Technology (EM64T) / Enhanced Intel Speedstep Technology (EIST) |
| L2 cache | 12MB / std and max / at processor speed |
| SMP support | 2-way SMP / up to two Xeon Processors (same speed/cache size) |
| Implementation | Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, four PCI-E slots or two PCI-E slots and two PCI-X slots, integrated SAS, ethernet and graphics controllers |
| Memory | 2 or 4GB std / 48GB ¹³ max / two slots used / ten slots available / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / Fully Buffered / Error Checking and Correcting (ECC) (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / Active Memory™: memory mirroring, online-spare memory, Chipkill |
| SAS/SATA controller | Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS or SATA (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports RAID 0, 1 & 10 / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 10, 5 & 6 (installed on reserved internal connector) / simultaneous SAS and SATA disks environments are unsupported |
| SAS connectors | One internal connection wired to DASD backplane / one external connector |
| IDE controller/cable | Enhanced IDE/ATA 100 controller in Enterprise South Bridge / one connector on planar / one 1-drop IDE cable (CD-RW/DVD-ROM) |
| Disk - capacity | None standard / supports 7200-15000 rpm disks / one backplane |
| Disk - bays | Some: six hot-swap 3.5" SAS or SATA HDD / some: eight hot-swap 2.5" SAS HDD / filler panels installed in open bays |
| Tape backup | Optional internal and external / 3.5" / USB or SATA |
| Mechanical Chipset | EIA 19" Rack (2U⁴) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides riser connector for either two PCI-Express x8 slots or two 64-bit/133MHz PCI-X slots / Enterprise Southbridge(ESB-2E) provides: two PCI-Express x8 slot with x4 Links, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8742XVUL for Super I/O |
| Bus slots | (See below) Four PCI-Express x8 or two PCI-X 1.0 and two PCI-Express x8 / no hot-swap Active™ PCI slots |
| Ethernet controller | Dual gigabit 10/100/1000 ethernet ports / Two Broadcom® 5708 / two full gigabit ethernet MAC and PHY layer functions / on planar / PCI-Express / full duplex / Wake on LAN® / TCP/IP Offload Engine (TOE) / Alert Standard Format 2.0 / two RJ-45 ports in rear |
| Optical / diskette | 8X-24X⁶ CD-RW/DVD-ROM / USB only |
| Front & Rear ports | Front: two USB (Vers 2.0), graphics (DB-15) Rear: two 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) | Xeon X5470 3.33GHz/1333MHz/12MB L2 Cache | 46M1034 |
| Software | ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others | Xeon L5430 2.66GHz/1333MHz/12MB L2 Cache | 46M1066 |
| Keyboard / mouse | None standard (because rack-based) / USB only | Xeon X5260 3.33GHz/1333MHz/6MB L2 Cache | 44E5164 |
| Power supply | Std/Max: one/two 835 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing | 1GB PC2-5300 FBD (2 x 512 MB) | 39M5782 |
| Fans | Calibrated Vectors Cooling™ Std: five fans; Max: ten (five fans with optional second power supply) / redundant with ten fans installed; All: variable speed / hot-swap / PFA | 2GB PC2-5300 FBD (2 x 1GB) | 39M5785 |
| Prerequisites | Monitor, keyboard, mouse, SAS/SATA disk, rack, OS | 4GB PC2-5300 FBD (2 x 2GB) | 39M5791 |
| | | 8GB PC2-5300 FBD (2 x 4GB) | 39M5797 |
| | | IBM ServeRAID-8k Adapter | 25R8064 |
| | | IBM Remote Supervisor Adapter II Slim | 39Y9566 |
| | | 250GB 7.2K rpm SATA II hot-swap | 39M4526 |
| | | 500GB 7.2K rpm SATA hot-swap 300MB/sec | 39M4530 |
| | | 750GB 7.2K rpm SATA hot-swap 300MB/sec | 43W5756 |
| | | 1TB 7.2K rpm SATA hot-swap 300MB/sec | 43W7676 |
| | | 300GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 43X0802 |
| | | 73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 40K1052 |
| | | 146GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0824 |
| | | 73.4GB 15K-rpm SAS SFF HS 2.5" (SFF tray) HDD | 43X0837 |
| | | 73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1043 |
| | | 146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD | 40K1044 |
| | | 835 Watt Hot-swap Power Supply Option (US) | 40K1905 |
| | | PCI Riser Card PCI-X Option | 40K1908 |



| | | |
|--------------|-------------|---|
| • 3.5" disk | • 3.5" disk | <p>2U Rack with 2.5" SAS</p> <p>• = Hot-swap (HS)</p> <p>Other options at ibm.com/products/us</p> |
| Tape Drive | • 3.5" disk | |
| — or — | • 3.5" disk | |
| 2x 3.5" disk | • 3.5" disk | |



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

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxw.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

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

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

| IBM® Type-model | Qty x Processor/Core | L3 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------|--------|-------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7947-12x | 1 x Xeon® E5502 | 1.86GHz/2C | 4MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-22x | 1 x Xeon E5504 | 2.0GHz/4C | 4MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-3Ax | 1 x Xeon E5506 | 2.13GHz/4C | 4MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-32x | 1 x Xeon E5520 | 2.26GHz/4C | 8MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-42x | 1 x Xeon L5520 | 2.26GHz/4C | 8MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-52x | 1 x Xeon E5530 | 2.40GHz/4C | 8MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-62x | 1 x Xeon E5540 | 2.53GHz/4C | 8MB | 2x1GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-72x | 1 x Xeon X5550 | 2.66GHz/4C | 8MB | 2x2GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-92x | 1 x Xeon X5570 | 2.93GHz/4C | 8MB | 2x2GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |

Positioning Processor(s) **Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 2.13GHz with 4MB L3 / 2 or 4 Core / Hyper-Threading 4 or 8MB std and max / at processor speed**

L3 cache SMP Implementation **2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers**

Memory **2 or 4GB std / 64GB max per processor(using 8GB DIMMs**) / PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring**

Disk Controller **LSI Logic® 1068 SAS/SATA controller / up to eight port / on riser card / PCI-Express / supports RAID-0/1/1E / upgradeable to LSI 1078(RAID-0/1/5/6/10/50/60) / optional battery backed cache / SATA controller integrated into ICH10**

Disk bays Flash Storage Tape backup **Eight 2.5-inch Small Form Factor (SFF) hot swap disk bays std / up to twelve optional / supports SAS, SATA or SSD SFF HS disks USB-based slot on SAS riser card for optional Hypervisor USB key Optional internal and external / 3.5" / USB or SATA connected via SAS riser card**

Mechanical Architecture/Chipset **EIA 19" Rack (2U) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel 5520 Chipset / Intel IO Hub provides PCI-Express slots and links to BCM5709C, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O**

BUS slots **(See below) Four second-generation PCI-Express x8 slots / convertible via riser(s) to two PCI-E x16 or four 64-bit 133MHz PCI-X**

Ethernet **Two Gigabit Ethernet ports / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / upgradeable to four Ethernet ports with additional Broadcom 5709 daughter card**

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

Graphics **SVGA / Matrox G200eV integrated in IMM on systemboard / 8MB DDR2-250MHz SDRAM std/max**

Systems Mgmt **Integrated Management Module (IMM) / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key**

Diagnostics Security **Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode**

Publications Keyboard / mouse **Installation Guide and Documentation CD None standard (because rack-based) / USB only**

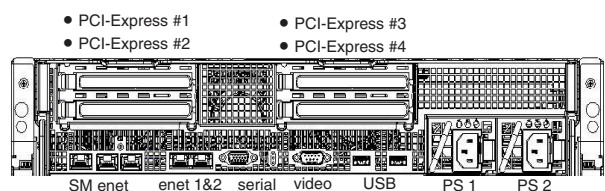
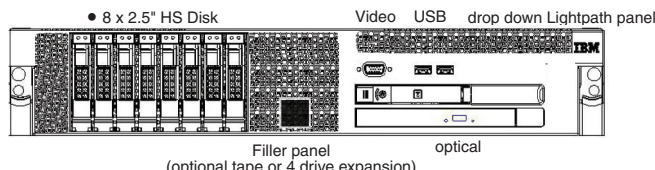
Power supply(s) **Std/Max: one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing**

Cooling **Calibrated Vecteded Cooling™ Std/Max: three / hot-swap redundant / variable speed / PFA**

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

- Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache 46M1077
- Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache 46M1078
- Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache 46M1079
- Xeon L5506 2.13GHz/4.8GTs/4MB L3 Cache 46M1082
- Xeon L5520 2.26GHz/5.86GTs/8MB L3 Cache 46M1080
- Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache 46M1081
- Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache 46M1083
- Xeon E5540 2.53GHz/5.86GTs/8MB L3 Cache 46M1084
- Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache 46M1085
- Xeon X5560 2.8GHz/6.4GTs/8MB L3 Cache 46M1086
- Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache 46M1087
- 1x1GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 44T1480
- 1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 44T1481
- 1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 44T1482
- 1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 44T1483
- IBM Virtual Media key 46C7526
- PCI-Express (2x8) Riser card 46M1072
- +4 HDD Drive Enablement kit 46D2516
- Dual-port 1 Gb Ethernet Daughter card 46M1076
- 675 Watt Hot-swap Power Supply Option (US) 46M1075
- IBM ServeRAID-MR10i SAS/SATA Controller 43W4296
- 73.4GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD 43W7535
- 146GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD 43W7536

2U Rack with 2.5" HS SAS



- Slot 1: PCI-Express x8, full length, full height
 - Slot 2: PCI-Express x8, low profile adapter with full height bracket
 - Slot 3: PCI-Express x8, full length, full height
 - Slot 4: PCI-Express x8, half length, full height
- **can be converted to from 4 x8 slots 2 x16 slots via optional riser card

- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (preboot DSA): 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, 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:
 2.5: SAS models: 2.4TB² with eight 300GB SFF disks(std)
 2.5: SAS models: 3.6TB² with twelve 300GB SFF disks(opt)

LIMITED WARRANTY³

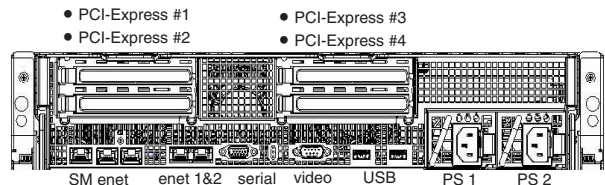
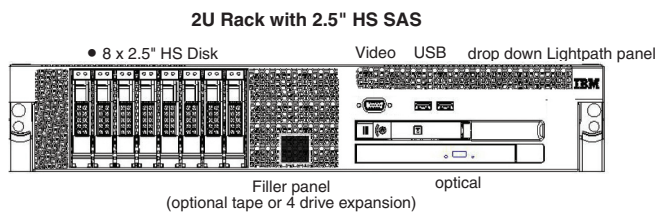
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac³ 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

** = 8GB dimms planned availability: June 2009

| IBM® Type-model | Qty x Processor/Core | L3 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------|--------|-------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7947-E1x* | 1 x Xeon® E5502 | 1.86GHz/2C | 4MB | 2x2GB | 2.5" Open | SAS/SATA | Combo | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-E2x* | 1 x Xeon E5530 | 2.40GHz/4C | 8MB | 2x2GB | 2.5" Open | SAS/SATA | Combo | 2 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |
| 7947-E3x* | 1 x Xeon X5560 | 2.8GHz/4C | 8MB | 4x2GB | 2.5" Open | SAS/SATA | Combo | 2 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Apr 2009 |

| | | |
|---------------------------------------|---|--|
| Positioning Processor(s) | <p><i>Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation</i></p> <p>Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.4GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 1.86GHz with 4MB L3 / 4 Core / Hyper-Threading</p> | |
| L3 cache SMP Implementation | <p>4 or 8MB std and max / at processor speed</p> <p>2-way SMP / up to two Xeon Processors (same speed/cache size)</p> <p>Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers</p> | |
| Memory | <p>2, 4 or 8GB std / 64GB max per processor(using 8GB DIMMs**) / PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring</p> | |
| Disk Controller | <p>LSI Logic® 1068 SAS/SATA controller / up to eight port / on riser card / PCI-Express / supports RAID-0/1/1E / upgradeable to LSI 1078(RAID-0/1/5/6/10/50/60) / optional battery backed cache / SATA controller integrated into ICH10</p> | |
| Disk bays Flash Storage Tape backup | <p>Eight 2.5-inch Small Form Factor (SFF) hot swap disk bays std / up to twelve optional / supports SAS, SATA or SSD SFF HS disks</p> <p>USB-based slot on SAS riser card for optional Hypervisor USB key</p> <p>Optional internal and external / 3.5" / USB or SATA connected via SAS riser card</p> | |
| Mechanical Architecture/Chipset | <p>EIA 19" Rack (2U¹) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion</p> <p>Intel 5520 Chipset / Intel IO Hub provides PCI-Express slots and links to BCM5709C, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O</p> | |
| BUS slots | <p>(See below) Four second-generation PCI-Express x8 slots / convertible via riser(s) to two PCI-E x16 or four 64-bit 133MHz PCI-X</p> | |
| Ethernet | <p>Two Gigabit Ethernet ports / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / upgradeable to four Ethernet ports with additional Broadcom 5709 daughter card</p> | |
| Optical / diskette Front & Rear ports | <p>8X-24X⁶ CD-RW/DVD-ROM / USB only</p> <p>Front: two USB (Vers 2.0), graphics (DB-15) Rear: two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port</p> | |
| Graphics | <p>SVGA / Matrox G200eV integrated in IMM on systemboard / 8MB DDR2-250MHz SDRAM std/max</p> | |
| Systems Mgmt | <p>Integrated Management Module (IMM) / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key</p> | |
| Diagnostics Security | <p>Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics</p> <p>Power-on password / administrator password / unattended boot / selectable boot / unattended start mode</p> | |
| Publications Keyboard / mouse | <p>Installation Guide and Documentation CD</p> <p>None standard (because rack-based) / USB only</p> | <p>Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache 46M1077</p> <p>Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache 46M1078</p> <p>Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache 46M1079</p> <p>Xeon L5506 2.13GHz/4.8GTs/4MB L3 Cache 46M1082</p> <p>Xeon L5520 2.26GHz/5.86GTs/8MB L3 Cache 46M1080</p> <p>Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache 46M1081</p> <p>Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache 46M1083</p> <p>Xeon E5540 2.53GHz/5.86GTs/8MB L3 Cache 46M1084</p> <p>Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache 46M1085</p> <p>Xeon X5560 2.8GHz/6.4GTs/8MB L3 Cache 46M1086</p> <p>Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache 46M1087</p> |
| Power supply(s) | <p>Std/Max: one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing</p> | <p>1x1GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 44T1480</p> <p>1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 44T1481</p> <p>1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 44T1482</p> <p>1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 44T1483</p> <p>IBM Virtual Media key 46C7526</p> <p>PCI-Express (2x8) Riser card 46M1072</p> <p>+4 HDD Drive Enablement kit 46D2516</p> <p>Dual-port 1 Gb Ethernet Daughter card 46M1076</p> <p>675 Watt Hot-swap Power Supply Option (US) 46M1075</p> <p>IBM ServeRAID-MR10i SAS/SATA Controller 43W4296</p> <p>73.4GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD 43W7535</p> <p>146GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD 43W7536</p> |
| Cooling | <p>Calibrated Vecteded Cooling™ Std/Max: three / hot-swap redundant / variable speed / PFA</p> | |
| Prerequisites | <p>Monitor, keyboard, mouse, SAS/SATA disk, rack, OS</p> | |



Slot 1: PCI-Express x8, full length, full height
 Slot 2: PCI-Express x8, low profile adapter with full height bracket
 Slot 3: PCI-Express x8, full length, full height
 Slot 4: PCI-Express x8, half length, full height
 **can be converted to from 4 x8 slots 2 x16 slots via optional riser card

- Quick release adapter slots (no screws)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (preboot DSA): 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, 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:
 2.5: SAS models: 2.4TB² with eight 300GB SFF disks(std)
 2.5: SAS models: 3.6TB² with twelve 300GB SFF disks(opt)

LIMITED WARRANTY³

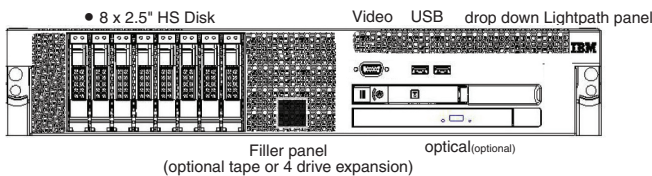
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Qty x Processor/Core | L3 cache | Memory | Disk | Disk controller | Optical | Power Supply | Disk bays | Slots x bays | Ethernet | Available date | |
|-----------------|----------------------|------------|--------|-------|-----------------|----------|--------------|-----------|--------------|----------|----------------|----------|
| 7947-64x | 1 x Xeon® E5540 | 2.53GHz/4C | 8MB | 1x4GB | 2.5" Open | SAS/SATA | open | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Oct 2009 |
| 7947-74x | 1 x Xeon X5550 | 2.66GHz/4C | 8MB | 1x4GB | 2.5" Open | SAS/SATA | open | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Oct 2009 |
| 7947-84x | 1 x Xeon X5560 | 2.8GHz/4C | 8MB | 1x4GB | 2.5" Open | SAS/SATA | open | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Oct 2009 |
| 7947-94x | 1 x Xeon X5570 | 2.93GHz/4C | 8MB | 1x4GB | 2.5" Open | SAS/SATA | open | 1 x 675W | 8 hot-swap | 4x9 | 2 x Gb | Oct 2009 |

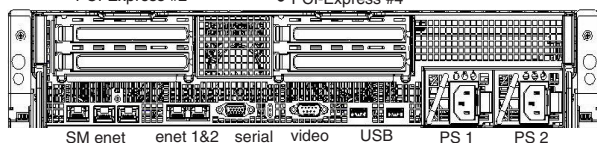
| | | | | | | | | | | | |
|---------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) | Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading | | | | | | | | | | |
| L3 cache SMP Implementation | 8MB std and max / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers | | | | | | | | | | |
| Memory | 4GB std / 64GB max per processor(using 8GB DIMMs) / PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring | | | | | | | | | | |
| Disk Controller | IBM ServeRAID 5015 SAS/SATA controller / up to eight 6Gb/s ports / on riser card / PCI-Express / supports RAID-0/1/5/6/10/50/60 / battery backed cache / SATA controller for optional optical integrated into ICH10 | | | | | | | | | | |
| Disk bays Flash Storage Tape backup | Eight 2.5-inch Small Form Factor (SFF) hot swap disk bays std / up to twelve optional / supports SAS, SATA or SSD SFF HS disks USB-based slot on SAS riser card for optional Hypervisor USB key Optional internal and external / 3.5" / USB or SATA connected via SAS riser card | | | | | | | | | | |
| Mechanical Architecture/Chipset | EIA 19" Rack (2U¹) / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion Intel 5520 Chipset / Intel IO Hub provides PCI-Express slots and links to BCM5709C, enterprise south bridge interface to ICH10 South Bridge / ICH10 South Bridge provides: USB, SATA, PCI-Express links to LSI SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O | | | | | | | | | | |
| BUS slots | (See below) Four second-generation PCI-Express x8 slots / convertible via riser(s) to two PCI-E x16 or four 64-bit 133MHz PCI-X | | | | | | | | | | |
| Ethernet | Two Gigabit Ethernet ports / Broadcom® 5709C / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / upgradeable to four Ethernet ports with additional Broadcom 5709 daughter card | | | | | | | | | | |
| Optical / diskette Front & Rear ports | Optional optical / USB only <i>Front:</i> two USB (Vers 2.0), graphics (DB-15) <i>Rear:</i> two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port | | | | | | | | | | |
| Graphics | SVGA / Matrox G200eV integrated in IMM on systemboard / 8MB DDR2-250MHz SDRAM std/max | | | | | | | | | | |
| Systems Mgmt | Integrated Management Module (IMM) / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key | | | | | | | | | | |
| Diagnostics Security | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | |
| Publications Keyboard / mouse | Installation Guide and Documentation CD None standard (because rack-based) / USB only | | | | | | | | | | |
| Power supply(s) | <i>Std/Max:</i> one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing | | | | | | | | | | |
| Cooling | Calibrated Vectored Cooling™ <i>Std/Max:</i> three / hot-swap redundant / variable speed / PFA | | | | | | | | | | |
| Prerequisites | Monitor, keyboard, mouse, SAS/SATA disk, rack, OS | | | | | | | | | | |

| | |
|--|---------|
| Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache | 46M1078 |
| Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache | 46M1079 |
| Xeon L5506 2.13GHz/4.8GTs/4MB L3 Cache | 46M1082 |
| Xeon L5520 2.26GHz/5.86GTs/8MB L3 Cache | 46M1080 |
| Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache | 46M1081 |
| Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache | 46M1083 |
| Xeon E5540 2.53GHz/5.86GTs/8MB L3 Cache | 46M1084 |
| Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache | 46M1085 |
| Xeon X5560 2.8GHz/6.4GTs/8MB L3 Cache | 46M1086 |
| Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache | 46M1087 |
| 1x1GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1480 |
| 1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1481 |
| 1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1482 |
| 1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM | 44T1483 |
| 1x8GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM | 46C7449 |
| IBM Virtual Media key | 46C7526 |
| PCI-Express (2x8) Riser card | 46M1072 |
| +4 HDD Drive Enablement kit | 46D2516 |
| Dual-port 1 Gb Ethernet Daughter card | 46M1076 |
| 675 Watt Hot-swap Power Supply Option (US) | 46M1075 |
| 146GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 43W7536 |
| 300GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 43W7670 |
| 500GB 7200-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD | 42D0707 |
| UltraSlim Enhanced SATA CD-RW/DVD-ROM Combo | 46M0901 |
| UltraSlim Enhanced SATA Multi-Burner | 46M0902 |

2U Rack with 2.5" HS SAS



- PCI-Express #1
- PCI-Express #2
- PCI-Express #3
- PCI-Express #4



- Slot 1: PCI-Express x8, full length, full height
 - Slot 2: PCI-Express x8, low profile adapter with full height bracket
 - Slot 3: PCI-Express x8, full length, full height
 - Slot 4: PCI-Express x8, half length, full height
- **can be converted to from 4 x8 slots 2 x16 slots via optional riser card

- ↳ Quick release adapter slots (no screws)
- ↳ Configuration/Setup Utility: F1 at startup
- ↳ Diagnostics (preboot DSA): 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, 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:
2.5: SAS models: 4TB² with eight 500GB SFF disks(std)
2.5: SAS models: 6TB² with twelve 500GB SFF disks(opt)

LIMITED WARRANTY³

- ↳ 3 year parts and labor
- ↳ International Warranty Service³
- ↳ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↳ 3 year on site warranty service upgrade options (in eligible locations):⁷
 - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac[®] 21P2077)
 - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
 - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P2093)
- ↳ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↳ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Qty x Processor | L2 cache | Memory | Ultra320 SCSI disk | SCSI controller | Mechanical | Slots x bays | Disk Bays | Alarm Panel | Power supply | Compliant | Available date |
|--------------------|------------------|----------|--------|------------------------------|-----------------|----------------------|--------------|-----------|-------------|--------------|-----------|----------------|
| 7980-51X | 2 x Xeon™ 3.2GHz | 2MB | 2GB | Open | 2 x Ultra320 | 2U ⁴ rack | 6x3 | 2 HS | Yes | DC power | NEBS-3 | Aug 2006 |
| 7980-52X | 2 x Xeon 3.2GHz | 2MB | 2GB | Open | 2 x Ultra320 | 2U rack | 6x3 | 2 HS | Yes | DC power | NEBS-3 | May 2006 |
| 7980-53X | 2 x Xeon 3.2GHz | 2MB | 2GB | Open | 2 x Ultra320 | 2U rack | 6x3 | 2 HS | Yes | AC power | | May 2006 |
| 7980-54X | 2 x Xeon 3.2GHz | 2MB | 2GB | 2 x 146.8GB ² 10K | 2 x Ultra320 | 2U rack | 6x3 | 2 HS | Yes | DC power | NEBS-3 | May 2006 |
| 7980-55X | 2 x Xeon 3.2GHz | 2MB | 2GB | 2 x 146.8GB10K | 2 x Ultra320 | 2U rack | 6x3 | 2 HS | Yes | AC power | | May 2006 |
| 7980-5CX | 2 x Xeon 3.2GHz | 2MB | 8GB | 2 x 146.8GB10K | 2 x Ultra320 | 2U rack | 6x3 | 2 HS | Yes | AC power | | July 2009 |

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

| | | | | | | | | | | | | |
|--------------------------|---|--|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) | <i>High performance, carrier grade reliability for providers of the Next Generation Network</i> 2 x Intel® Xeon 3.2GHz with 800MHz FSB / Optimized for Extended Memory 64 Technology™ (EM64T) / Hyper-Threading | | | | | | | | | | | |
| L2 cache Implementation | 2MB std and max / ECC / at processor speed | | | | | | | | | | | |
| SMP support | Systemboard contains two Intel 604 pin micro-PGA ZIF sockets, six DIMM sockets, two PCI riser connectors, and integrated subsystems 2-way SMP via second identical processor is standard | | | | | | | | | | | |
| Memory | 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 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 300GB Ultra320 SCSI, 15K 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 Rack support | EIA 19" Rack (2U⁴) x 20-inch deep 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 Ethernet | (See diagram below): 3 bays / two disk bays (hot-swap) / one peripheral drive bay 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 Ports | 24X-10X⁶ slim-line CD-DVD ROM (applies to 51X, 53X, 54X & 55X models) (52X model CD-ROM only) / USB only 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 | | | | | | | | | | | |
| 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 | | | | | | | | | | | |

Options available via special Bid



2U Rack

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

- ⇒ Raven black color (front bezel)
- ⇒ Configuration/Setup Utility invoked by pressing F2 at startup
- ⇒ SCSISelect near startup by pressing CTRL+A
- ⇒ PC-Doctor™ diagnostics on diskette
- ⇒ Several hardcopy publications
- ⇒ H 3.45" x W 17.14" x D 20.0"
- ⇒ H 87.6 mm x W 435.3 mm x D 508 mm
- ⇒ 34 to 37 pounds (15.4 to 16.8 kg)
- ⇒ IPMI 1.5 and WfM 2.0-compliant

All models: Max int disk capacity: 600GB² with two 300GB 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

| 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 |
|-----------------|-------------------|------------|----------|-----------|--------|-------------------|-----------|--------------|--------------|-------------------------------|----------------|
| 7943 - 32U | 1 x Opteron™ 2352 | 2.1GHz/QC | 2MB | CD-RW/DVD | 2x1GB | Open/SAS/SATA | 8-2.5"HS | 4x10 | Dual Gigabit | 3 | July 2008 |
| 7943 - 34U | 1 x Opteron 2352 | 2.1GHz/QC | 2MB | CD-RW/DVD | 2x1GB | Open/SAS/SATA | 6-3.5"HS | 4x7 | Dual Gigabit | 3 | July 2008 |
| 7943 - 52U | 1 x Opteron 2356 | 2.3GHz/QC | 2MB | CD-RW/DVD | 2x1GB | Open/SAS/SATA | 8-2.5"HS | 4x10 | Dual Gigabit | 3 | July 2008 |
| 7943 - 22U | 1 x Opteron 2344 | 1.7GHz/QC | 2MB | CD-RW/DVD | 2x1GB | Open/SAS/SATA | 6-3.5"HS | 4x7 | Dual Gigabit | 3 | Aug 2008 |
| 7943 - E1U | 1 x Opteron 2344 | 1.7GHz/QC | 2MB | CD-RW/DVD | 4x1GB | Open/SAS/SATA | 6-3.5"HS | 4x7 | Dual Gigabit | 3 | Aug 2008 |
| 7943 - E2U | 1 x Opteron 2352 | 2.1GHz/QC | 2MB | CD-RW/DVD | 4x1GB | Open/SAS/SATA | 8-2.5"HS | 4x10 | Dual Gigabit | 3 | Aug 2008 |

Positioning Processor(s) **Rack optimized, Quad-Core, Dual-Socket business performance server**
 Up to two AMD® Opteron 2000 Series Quad-Core Processors up to 2.3GHz¹ / simultaneously supports 32 and 64-bit computing
L2 cache **512KB** / per core / at processor speed
SMP support Implementation **2-way SMP** / up to two Opteron Processors (same speed cache size required)
 Systemboard contains two AM2 sockets, sixteen memory DIMM slots, integrated SAS & SATA, dual ethernet, graphics, one PCI-E x4 slot, two PCI-E x8 slots and one HyperTransport (HTx) slot via riser card

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

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

Mechanical Chipset **EIA 19" Rack (2U⁴)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
ServerWorks™ Chipset / HT2100 System I/O Controller provides: two PCI-Express x8 slot, one PCI-Express x4 slot, HyperTransport bridge to HT1000 South Bridge / **HT1000 South Bridge** provides: PCI-X, USB(2.0), ATI video, SATA, Dual GB ethernet, IDE and LPC bus to NS PC87427 for Super I/O
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 Dual Gigabit 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 Ports 24x/10x/24x/8x CD-RW/DVD / IDE / *Diskette* none (USB diskette optional)
Graphics 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
Keyboard / mouse SVGA / ATI® ES1000(RN50b) / on planar / 16MB SDRAM std/max
 None standard (because rack-based) / USB only

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

| | |
|--|---------|
| Quad Core AMD Opteron Processor Model 2344 | 46M2282 |
| Quad Core AMD Opteron Processor Model 2352 | 44R5930 |
| Quad Core AMD Opteron Processor Model 2356 | 44R5932 |
| 1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM | 41Y2759 |
| 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM | 41Y2762 |
| 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM | 41Y2765 |
| 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM | 41Y2768 |
| IBM 73GB 10K 3.5" SAS Hot-Swap HDD | 40K1039 |
| IBM 146GB 10K 3.5" SAS Hot-Swap HDD | 40K1040 |
| IBM 300GB 10K 3.5" SAS Hot-Swap HDD | 40K1041 |
| IBM 36GB 15K 3.5" SAS Hot-Swap HDD | 40K1042 |
| IBM 73GB 15K 3.5" SAS Hot-Swap HDD | 40K1043 |
| IBM 146GB 15K 3.5" SAS Hot-Swap HDD | 40K1044 |
| IBM 36GB 15K SAS SFF Hot-Swap HDD | 40K1051 |
| IBM 73GB 15K SAS SFF Hot-Swap HDD | 40K1052 |
| IBM 500GB 7.2K 3.5" SATA Hot-Swap HDD | 39M4530 |
| IBM 750GB 3.5" SATA Hot-Swap HDD | 43W7576 |
| IBM SAS HBA Controller | 25R8060 |
| PCI-E x16 Riser Card | 40K7428 |
| PCI-X Riser Card | 40K7427 |
| IBM Remote Supervisor Adapter II Slimline | 39Y9566 |
| IBM ServeRAID 8k SAS Controller | 25R8064 |
| Qlogic Infinipath HTx Infiniband Adapter | 41Y4519 |
| 835W Redundant Power Supply (US) | 40K1905 |

Other options at ibm.com/products/us

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

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

2U Rack with 2.5" SAS

| Bay | Height | Access | Optical | Media |
|--------|-------------|-----------------------------|-----------|-----------|
| 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 | 2.5" disk | 2.5" disk |
| Bay 4 | 2.5", SFF | 1", access, hot-swap, open | | |
| Bay 5 | 2.5", SFF | 1", access, hot-swap, open | | |
| Bay 6 | 2.5", SFF | 1", access, hot-swap, open | | |
| Bay 7 | 2.5", SFF | 1", access, hot-swap, open | | |
| Bay 8 | 2.5", SFF | 1", access, hot-swap, open | | |
| Bay 9 | 2.5", SFF | 1", access, hot-swap, open | | |
| Bay 10 | 2.5", SFF | 1", access, hot-swap, open | | |

Maximum internal disk capacity¹³:
 4.5TB with six 750GB SATA disks or • = Hot-swap (HS)
 2.4TB with six 300GB SAS disks

2U Rack with 3.5" SAS/SATA

| Bay | Height | Access | Optical | Media |
|-------|-------------|----------------------------|---------|-------|
| Bay 1 | 5.25", 0.5" | access, slim CD-RW/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 | | |
| Bay 6 | 3.5", SL 1" | access, hot-swap, open | | |
| Bay 7 | 3.5", SL 1" | access, hot-swap, open | | |

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

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 1 year IOR 9x5, 4 hr avg response (ServicePac® part num 69P9403)
 - 2 year IOR 24x7, 4 hr avg response (ServicePac part num 96P2123)
 - 2 year IOR 24x7, 2 hr avg response (ServicePac part num 96P2124)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 21P2078)
 - 3 year IOR 9x5, NBD response (ServicePac part num 69P9258)
- Other ServicePac options at www.ibm.com/services/us/its/pdf/wamomxeu.pdf
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁵

| IBM® Type-model | Qty x Processor | Speed/Core | L2 cache | Watts | CPU/Memory cards | Memory | DIMM slots | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date |
|-----------------|---------------------|------------|----------|-------|------------------|---------|------------|-----------------|----------------------|--------------|-----------------------|-----------------|----------------|
| 8877-1RY | 1 x Opteron™ 8212 | 2.0GHz/DC | 2MB | 95W | One | 2x512MB | 8 | SAS | 4U ⁴ rack | 7x5 | 1 x 1500W | 3 | Sep 2006 |
| 8877-2RY | 1 x Opteron 8214 | 2.2GHz/DC | 2MB | 95W | One | 2x512MB | 8 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Sep 2006 |
| 8877-4RY | 2 x Opteron 8218 | 2.6GHz/DC | 2MB | 95W | Two | 4x1GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Sep 2006 |
| 8877-5RY | 2 x Opteron 8220 SE | 2.8GHz/DC | 2MB | 120W | Two | 4x1GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Sep 2006 |
| 8877-3RY | 1 x Opteron 8216 | 2.4GHz/DC | 2MB | 95W | One | 2x512MB | 8 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Apr 2007 |
| 8877-5SY | 2 x Opteron 8220 | 2.8GHz/DC | 2MB | 95W | One | 4x1GB | 8 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Apr 2007 |
| 8877-6RY | 2 x Opteron 8222 SE | 3.0GHz/DC | 2MB | 120W | One | 4x1GB | 8 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | May 2007 |
| 8677-E4U | 2 x Opteron 8218 | 2.6GHz/DC | 2MB | 95W | One | 4x2GB | 8 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Apr 2007 |
| 8877-7RY | 2 x Opteron 8224 SE | 3.2GHz/DC | 2MB | 120W | One | 4x1GB | 8 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Oct 2007 |

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

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

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

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

Bus Slots (See below) Four total PCI-Express / two PCI-X at up to 133 MHz / one HTx / one dedicated slot for optional RSA II daughter card

DVD-ROM / diskette 8X⁶ 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)

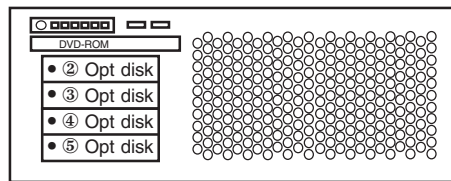
Security Systems mgmt Power-on and administrator passwords / unattended boot / selectable boot
 BMC standard / IPMI 2.0 / **Active Energy Manager™** / **Remote Supervisor Adapter II Slimline** optional (std on E4U) / PCI adapter / includes 10/100 ethernet and serial connectors / provides remote console and mgmt / power on/off system / monitors power status, op system, temperature, disks, fans, power supplies

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

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

Keyboard / mouse None standard (because rack-based)
 Power supplies **Std:** one 1500 watt hot-swap(240 VAC); **Max:** two hot-swap / redundant with two power supplies (some configurations) / worldwide / voltage-sensing / auto-restart / PFA
 Cooling fans **Calibrated 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 8216 | 43W7244 |
| Dual Core AMD Opteron Processor Model 8218 | 40K1202 |
| Dual Core AMD Opteron Processor Model 8220 | 43W7246 |
| Dual Core AMD Opteron Processor Model 8220SE | 40K1203 |
| Dual Core AMD Opteron Processor Model 8222SE | 43W7247 |
| Dual Core AMD Opteron Processor Model 8224SE | 44R6036 |
| 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 |



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 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 300GB² hot-swap SAS disks

LIMITED WARRANTY³

- ⊖ 3 year parts and labor
- ⊖ International Warranty Service³
- ⊖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⊖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response 69P9507
 - 3 year IOR 24x7, 2 hr avg response 69P9508
 - 1 year IOR 9x5, NBD response 69P9398
 - 2 year IOR 9x5, NBD response 96P2117
- ⊖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Qty x Processor | 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 |
|--------------------|---------------------|------------|-------------|-------|---------------------|--------|---------------|--------------------|----------------------|-----------------|--------------------------|--------------------|-------------------|
| 7163-1RU | 2 x Opteron™ 8350 | 2.0GHz/QC | 2MB | 115W | Two | 4x1GB | 16 | SAS | 4U ⁴ rack | 7x5 | 1 x 1500W | 3 | June 2008 |
| 7163-3RU | 2 x Opteron 8356 | 2.3GHz/QC | 2MB | 115W | Two | 4x1GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | June 2008 |
| 7163-5RU | 2 x Opteron 8360 SE | 2.5GHz/QC | 2MB | 137W | Two | 4x1GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | July 2008 |
| 7163-ARU | 2 x Opteron 8378 | 2.4GHz/QC | 2MB | 75W | Two | 4x1GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Mar 2009 |
| 7163-DRU | 2 x Opteron 8384 | 2.7GHz/QC | 2MB | 75W | Two | 4x1GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Mar 2009 |
| 7163-DBU | 3 x Opteron 8384 | 2.7GHz/QC | 2MB | 75W | Three | 6x2GB | 24 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | Mar 2009 |

Positioning Processors L2 cache Processor upgrade Implementation
Up to 4-way, high performance server with maximum memory availability and superior performance per watt
 Up to three AMD® Opteron 8000 Series Quad-Core Processor up to 2.7GHz¹ / simultaneously supports 32 and 64-bit computing
512KB / per core / at processor speed
4-way SMP / up to four Opteron Processors (same speed/cache size)
 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™
4GB std / 32GB max per processor (128GB max per chassis using four cpu/memory cards) / two pr three cpu/memory card standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 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

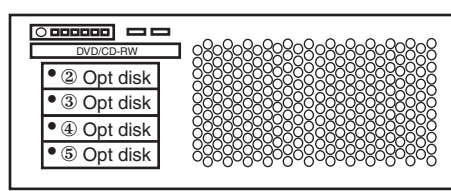
SAS disk controller
Adaptec® AIC-9580W SAS controller (3Gb/sec) / dual channel / four port / on planar / PCI-Express / **RAID 0, 1 & 10** / optional IBM ServeRAID™-8k Adaptor for low-cost RAID 0, 1, 1E, 5, 00, 10, 1E0, 50 (installed on reserved internal connector)
 SAS connectors One internal connection 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 (See below) Four total PCI-Express / two PCI-X at up to 133 MHz / one HTx / one dedicated slot for optional RSA II daughter card

Optical / diskette Ethernet
 24X-10x⁶ Slim DVD/CD-RW / none
 Dual Broadcom® 5708C Gigabit 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 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 Systems mgmt
 Power-on and administrator passwords / unattended boot / selectable boot
 BMC standard / IPMI 2.0 / **Active Energy Manager™** / **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) | Quad Core AMD Opteron Processor Model 8378 | 46M2489 |
| 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 | Quad Core AMD Opteron Processor Model 8380 | 46M2492 |
| Cooling fans | Calibrated Vektored Cooling™ Std: three fans; Max: six / hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and management processor / redundant fan kit required for three or more processors | Quad Core AMD Opteron Processor Model 8382 | 46M2495 |
| | | Quad Core AMD Opteron Processor Model 8384 | 46M2498 |
| | | Quad Core AMD Opteron Processor Model 8350 | 43R6295 |
| | | Quad Core AMD Opteron Processor Model 8356 | 43W7406 |
| | | Quad Core AMD Opteron Processor Model 8360SE | 43W7408 |
| | | 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM | 41Y2762 |
| | | 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM | 46C7539 |
| | | 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM | 46C7538 |
| | | 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 |
| | | Other options at ibm.com/products/us | |



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

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

- 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

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response ServicePac® part number 96P2253
 - 3 year IOR 24x7, 2 hr avg response ServicePac® part number 96P2254
 - 1 year IOR 9x5, NBD response ServicePac® part number 69P9402
 - 2 year IOR 9x5, NBD response ServicePac® part number 96P2121
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

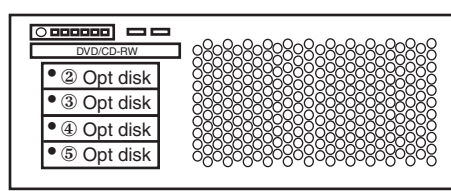
All models: Maximum internal disk capacity: 1.2TB with four 300GB² hot-swap SAS disks

| 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 |
|--------------------|-------------------|------------|-------------|-------|---------------------|--------|---------------|--------------------|----------------------|-----------------|--------------------------|--------------------|-------------------|
| 7163-62U | 2 x Opteron™ 8431 | 2.4GHz/6C | 3MB | 75W | Two | 4x2GB | 16 | SAS | 4U ⁴ rack | 7x5 | 1 x 1500W | 3 | July 2009 |
| 7163-72U | 2 x Opteron 8435 | 2.6GHz/6C | 3MB | 75W | Two | 4x2GB | 16 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | July 2009 |
| 7163-7BU | 3 x Opteron 8435 | 2.6GHz/6C | 3MB | 75W | Three | 6x2GB | 24 | SAS | 4U rack | 7x5 | 1 x 1500W | 3 | July 2009 |

| | |
|---|---|
| Positioning Processors L2 cache Processor upgrade Implementation | Four socket, high performance server with maximum memory availability and superior performance per watt Up to 4 x AMD® Opteron 8000 Series Six-Core Processors up to 2.6GHz ¹ / simultaneously supports 32 and 64-bit computing 512KB / per core / at processor speed 4-way SMP / up to four Opteron Processors (same speed/cache size) 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™ | 8 or 12GB std / 32GB max per processor (128GB max per chassis using four cpu/memory cards) / two pr three cpu/memory card standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 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 SAS connectors IDE controller / cabling Disk - capacity Disk - bays Mechanical | 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) One internal connection wired to DASH backplane Enhanced IDE ATA-100 controller integrated in South Bridge / one connector on planar / one 1-drop IDE cable (DVD-ROM) Supports up to 300GB 10K rpm disks Four 3.5" hot-swap bays / converged tray / SAS connectors 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 (See below) Four total PCI-Express / two PCI-X at up to 133 MHz / one HTx / one dedicated slot for optional RSA II daughter card |
| Bus Slots | |
| Optical / diskette Ethernet | 24X-10x ⁶ Slim DVD/CD-RW / none Dual Broadcom® 5708C Gigabit 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 Ports | ATI® RN50(ES1000) / on planar / 16MB SDRAM std/max / 32-bit 33MHz PCI 2.2 bus Rear: RSA ethernet, RSA serial, one USB(2.0), keyboard, mouse, analog DB-15 graphics, two ethernet, std. serial RS-485 / Front: two USB(2.0) |
| Security Systems mgmt | Power-on and administrator passwords / unattended boot / selectable boot BMC standard / IPMI 2.0 / Active Energy Manager™ / 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 Power supplies | None standard (because rack-based) 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 | Six Core AMD Opteron Processor Model 8378 Six Core AMD Opteron Processor Model 8380 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 RDIMM IBM 73GB 10K HS 3.5" SAS HDD IBM 146GB 10K HS 3.5" SAS HDD IBM 300GB 10K HS 3.5" SAS HDD IBM ServeRAID 8k SAS Controller 1500W US Power Supply Redundant Fan Kit - 3 Fans Processor Pass Thru Card | 59Y3093 59Y3094 41Y2762 46C7539 46C7538 40K1039 40K1040 40K1041 25R8064 40K7543 40K7545 40K7547 |
| Cooling fans | Calibrated Vektored Cooling™ Std: three fans; Max: six / hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and management processor / redundant fan kit required for three or more processors | | |

Other options at ibm.com/products/us



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

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

- ⊖ 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

LIMITED WARRANTY³

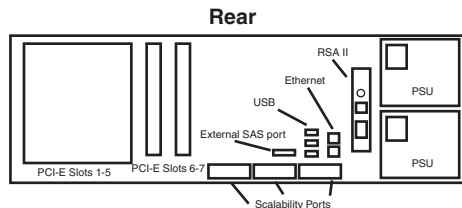
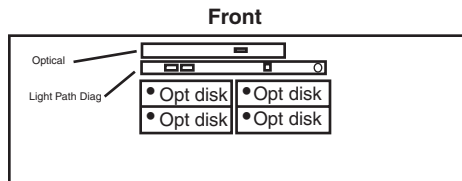
- ⊖ 3 year parts and labor
- ⊖ International Warranty Service³
- ⊖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ⊖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response ServicePac® part number 96P2253
 - 3 year IOR 24x7, 2 hr avg response ServicePac® part number 96P2254
 - 1 year IOR 9x5, NBD response ServicePac® part number 69P9402
 - 2 year IOR 9x5, NBD response ServicePac® part number 96P2121
- ⊖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

All models: Maximum internal disk capacity: 1.2TB with four 300GB² hot-swap SAS disks

| IBM® Type-model | Qty x Processor | Core | L2 cache | Memory | DIMM slots | Memory cards | RSA II | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date |
|-----------------|---------------------------|------|----------|--------|------------|--------------|--------|-----------------|----------------------|--------------|-----------------------|-----------------|----------------|
| 7141-1RU | 2 x Xeon™ MP E7210 2.4GHz | DC | 2x4MB | 4x1GB | 16 | Two | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 | Dec 2007 |
| 7141-2RU | 2 x Xeon MP E7320 2.13GHz | QC | 2x2MB | 4x1GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Dec 2007 |
| 7141-3RU | 2 x Xeon MP E7330 2.4GHz | QC | 2x3MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Dec 2007 |
| 7141-4RU | 2 x Xeon MP X7350 2.93GHz | QC | 2x4MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Dec 2007 |

| | |
|----------------------------------|--|
| Processors | Two 64-bit Intel® Xeon™ Processor MP up to 2.4GHz¹Dual-Core / up to 2.93GHz²Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T) |
| L2 cache | 2 x 2, 3 or 4 MB / on-die / at processor speed |
| Processor upgrade Implementation | 4-way SMP / up to four Xeon Processors MP (same speed/cache size) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, two Active™ PCI-E x8 slots, five PCI-E x8 slots and integrated SAS, ethernet, graphics |
| Active Memory™ | 4 or 8GB std / 128GB max per chassis using high-capacity memory card / two or four memory cards standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / 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 | Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1 Optional: ServeRAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup |
| SAS connectors | Controller wired to SAS backplane / external 4x SAS port on rear |
| IDE controller | Enhanced IDE ATA-100 controller in ICH7 South Bridge |
| Disk - capacity | Supports up to 146GB 10K or 73GB 15K rpm disks |
| Disk - bays | Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors |
| Mechanical | EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks |
| Chipset | IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional ServeRAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video) |
| Slots | Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length |
| Optical / diskette | 24x8x ⁶ CD-RW/DVD Combo / none |
| Ethernet | Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 |
| Graphics controller | SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max |
| Ports | Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet Front: two USB (2.0) |
| Security | Power-on and administrator passwords / unattended boot / selectable boot |
| System management | BMC standard / IPMI 2.0 / IBM Active Energy Manager™ / Remote Supervisor Adapter II Slimline std / 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 | Light Path Diagnostics Card / 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/Max: Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / PFA | 2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB) 41Y2762 4GB PC2-5300 CL5 ECC DDR2 RDIMM (2x2GB) 41Y2771 8GB PC2-5300 CL5 ECC DDR2 RDIMM (2x4GB) 41Y2768 |
| 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 | IBM Active Memory 8-slot Expansion Card 44E4252 IBM Internal Removable Flash Drive 44E4251 Xeon E7210 2.4GHz/8MB L2/Dual Core Proc 44E4244 Xeon E7320 2.13GHz/4MB L2/Quad Core Proc 44E4241 Xeon E7330 2.4GHz/6MB L2/Quad Core Proc 44E4242 Xeon X7350 2.93GHz/8MB L2/Quad Core Proc 44E4243 IBM ServeRAID-MR10k SAS Controller 43W4280 IBM 73GB 10K 2.5" SAS Hot-swap HDD 40K1052 IBM 146GB 10K 2.5" SAS Hot-swap HDD 43X0824 IBM 73GB 15K 2.5" SAS Hot-Swap HDD 43X0837 |



- Bay ① 5.25", 0.5" access, CD-RW/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

- Five available PCI-E x8 slots:
- Slot 1 - full-height, half-length, PCI-E x8
 - Slot 2 - full-height, half-length, PCI-E x8
 - Slot 3 - full-height, half-length, PCI-E x8
 - Slot 4 - full-height, half-length, PCI-E x8
 - Slot 5 - full-height, half-length, PCI-E x8

- Two available Hot-swap PCI-E x8 slots:
- Slot 6 - full-height, half-length, PCI-E x8, hot-swap
 - Slot 7 - full-height, half-length, PCI-E x8, hot-swap

- ↳ Dimensions: H6.8" x W17.46" x D28.35"
- ↳ Dimensions: H172mm x W443mm x D720mm
- ↳ Weight: 70 to 95lbs; 31.75 to 43.2kg
- ↳ Stealth black color
- ↳ Tool-free serviceability
- ↳ Access power supplies from rear
- ↳ Access adapters, processors, memory and systemboard from top
- ↳ Setup Program by pressing F1 at startup
- ↳ Diagnostics (DSA) by pressing F2 at startup
- ↳ SAS Select by pressing Ctrl+C 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: 584GB with four 146GB² hot-swap SAS disks

Other options at ibm.com/products/us/

LIMITED WARRANTY³

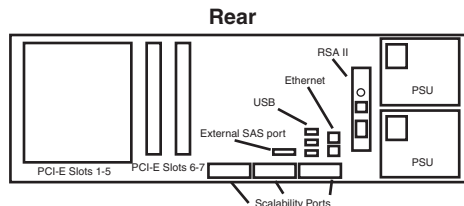
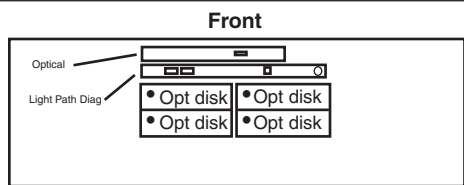
- ↳ **3 year parts and labor**
- ↳ **International Warranty Service³**
- ↳ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↳ **On site service upgrade options (in eligible locations):⁷**
 - 3 year IOR 24x7, 4 hr avg response** 10N3059
 - 3 year IOR 24x7, 2 hr avg response** 10N3060
 - 4 year IOR 9x5, NBD response** 10N3061
 - 5 year IOR 9x5, NBD response** 10N3065
- ↳ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↳ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

| IBM® Type-model | Qty x Processor | Core | L2 cache | Memory | DIMM slots | Memory cards | RSA II | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date |
|-----------------|--------------------|--------|----------|--------|------------|--------------|--------|-----------------|----------------------|--------------|-----------------------|-----------------|----------------|
| 7141-1LU | 1 x Xeon™ MP E7210 | 2.4GHz | 2 2x4MB | 2x2GB | 8 | One | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 | Aug 2009 |
| 7141-2LU | 1 x Xeon MP E7310 | 1.6GHz | 2 2x2MB | 2x2GB | 8 | One | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Aug 2009 |

| | |
|----------------------------------|--|
| Processors | Up to two 64-bit Intel® Xeon™ Processor MP up to 2.4GHz¹ Two-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T) |
| L2 cache | 4 or 8MB / on-die / at processor speed |
| Processor upgrade Implementation | 4-way SMP / up to four Xeon Processors MP (same speed/cache size) |
| Active Memory™ | 4GB std / 128GB max per chassis using high-capacity memory card / one memory cards std (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / Error Checking and Correcting (ECC) via 16-bit Checksum Cmpikill™ / 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 | <i>Std:</i> LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1 <i>Optional:</i> ServeRAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup |
| SAS connectors | Controller wired to SAS backplane / external 4x SAS port on rear |
| IDE controller | Enhanced IDE ATA-100 controller in ICH7 South Bridge |
| Disk - capacity | Supports up to 146GB 10K or 73GB 15K rpm disks |
| Disk - bays | Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors |
| Mechanical | EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks |
| Chipset | IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional ServeRAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video) |
| Slots | Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length |
| Optical / diskette | 24x/8x ⁶ CD-RW/DVD Combo / none |
| Ethernet | Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 |
| Graphics controller | SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max |
| Ports | <i>Rear:</i> RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet <i>Front:</i> two 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 / 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 | Light Path Diagnostics Card / 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 | <i>Std/Max:</i> Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / PFA | 2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB) | 41Y2762 |
| 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 | 4GB PC2-5300 CL5 ECC DDR2 RDIMM (2x2GB) | 41Y2771 |
| | | 8GB PC2-5300 CL5 ECC DDR2 RDIMM (2x4GB) | 41Y2768 |
| | | 16GB PC2-5300 CL5 ECC DDR2 RDIMM (2x8GB) | 43V7356 |
| | | IBM Active Memory 8-slot Expansion Card | 44E4252 |
| | | IBM Internal Removable Flash Drive | 44E4251 |
| | | Xeon E7210 2.4GHz/6MB L2/Two-Core Proc | 44E4244 |
| | | Xeon E7310 1.6GHz/6MB L2/Two-Core Proc | 44W2784 |
| | IBM ServeRAID-MR10k SAS Controller | 43W4280 | |
| | IBM 73GB 10K 2.5" SAS Hot-swap HDD | 40K1052 | |
| | IBM 146GB 10K 2.5" SAS Hot-Swap HDD | 43X0824 | |
| | IBM 73GB 15K 2.5" SAS Hot-Swap HDD | 43X0837 | |

Other options at ibm.com/products/us/



- Bay ① 5.25", 0.5" access, CD-RW/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
- Five available PCI-E x8 slots:
- Slot 1 - full-height, half-length, PCI-E x8
 - Slot 2 - full-height, half-length, PCI-E x8
 - Slot 3 - full-height, half-length, PCI-E x8
 - Slot 4 - full-height, half-length, PCI-E x8
 - Slot 5 - full-height, half-length, PCI-E x8
- Two available Hot-swap PCI-E x8 slots:
- Slot 6 - full-height, half-length, PCI-E x8, hot-swap
 - Slot 7 - full-height, half-length, PCI-E x8, hot-swap

- ↪ Dimensions: H6.8" x W17.46" x D28.35"
- ↪ Dimensions: H172mm x W443mm x D720mm
- ↪ Weight: 70 to 95lbs; 31.75 to 43.2kg
- ↪ Stealth black color
- ↪ Tool-free serviceability
- ↪ Access power supplies from rear
- ↪ Access adapters, processors, memory and systemboard from top
- ↪ Setup Program by pressing F1 at startup
- ↪ Diagnostics (DSA) by pressing F2 at startup
- ↪ SAS Select by pressing Ctrl+C 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 300GB² hot-swap SAS disks

LIMITED WARRANTY³

- ↪ **3 year parts and labor**
- ↪ **International Warranty Service³**
- ↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↪ **On site service upgrade options (in eligible locations):⁷**
 - 3 year IOR 24x7, 4 hr avg response**
10N3059
 - 3 year IOR 24x7, 2 hr avg response**
10N3060
 - 4 year IOR 9x5, NBD response**
10N3061
 - 5 year IOR 9x5, NBD response**
10N3065
- ↪ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↪ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

| IBM® Type-model | Qty x Processor | Core | L2 cache | Memory | DIMM slots | Memory cards | RSA II controller | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date |
|--------------------|----------------------------|------|-------------|--------|---------------|-----------------|----------------------|--------------------|----------------------|-----------------|--------------------------|--------------------|-------------------|
| 7233-2RU | 2 x Xeon™ MP E7420 2.13GHz | 4 | 2x3MB | 4x1GB | 16 | Two | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-5RU | 2 x Xeon MP E7450 2.4GHz | 6 | 3x3MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-6RU | 2 x Xeon MP X7460 2.66GHz | 6 | 3x3MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-7RU | 2 x Xeon MP L7445 2.13GHz | 4 | 2x3MB | 4x1GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-E5U* | 2 x Xeon MP E7450 2.4GHz | 6 | 3x3MB | 8x2GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-E2U* | 1 x Xeon MP E7420 2.13GHz | 4 | 2x3MB | 2x1GB | 8 | One | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Mar 2009 |
| 7233-4RU | 2 x Xeon MP E7440 2.4GHz | 4 | 2x3MB | 4x1GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Apr 2009 |

Processors **Two 64-bit Intel® Xeon™ Processor MP up to 2.66GHz¹ Six-Core / up to 2.13GHz¹ Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T)**
 L2 cache **6 or 9MB / on-die / at processor speed**
 Processor upgrade Implementation **4-way SMP / up to four Xeon Processors MP (same speed/cache size)**
 System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, two Active™ PCI-E x8 slots, five PCI-E x8 slots and integrated SAS, ethernet, graphics

Active Memory™ **4, 8 or 16GB std / 128GB max per chassis using high-capacity memory card / two or four memory cards standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / 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 **Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1**
Optional: ServeRAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup
 SAS connectors **Controller wired to SAS backplane / external 4x SAS port on rear**
 IDE controller **Enhanced IDE ATA-100 controller in ICH7 South Bridge**
 Disk - capacity **Supports up to 146GB 10K or 73GB 15K rpm disks**
 Disk - bays **Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors**
 Mechanical **EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks**

Chipset **IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional ServeRAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video)**
 Slots **Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length**
 Optical / diskette **24x8x6 CD-RW/DVD Combo / none**
 Ethernet **Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2**
 Graphics controller **SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max**
 Ports **Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet**
Front: two 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 / 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 **Light Path Diagnostics Card / 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/Max: Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / 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**

Front

Rear

Other options at ibm.com/products/us/

- Xeon E7420 2.13GHz/6MB L2/Quad-Core Proc 44E4469
- Xeon E7440 2.4GHz/6MB L2/Quad-Core Proc 44E4471
- Xeon L7445 2.13GHz/6MB L2/Quad-Core Proc 44E4517
- Xeon E7450 2.4GHz/9MB L2/Six-Core Proc 44E4472
- Xeon X7460 2.66GHz/9MB L2/Six-Core Proc 44E4473
- IBM ServeRAID-MR10k SAS Controller 43W4280
- IBM 73GB 10K 2.5" SAS Hot-swap HDD 40K1052
- IBM 146GB 10K 2.5" SAS Hot-Swap HDD 43X0824
- IBM 73GB 15K 2.5" SAS Hot-Swap HDD 43X0837

- ↪ Dimensions: H6.8" x W17.46" x D28.35"
- ↪ Dimensions: H172mm x W443mm x D720mm
- ↪ Weight: 70 to 95lbs; 31.75 to 43.2kg
- ↪ Stealth black color
- ↪ Tool-free serviceability
- ↪ Access power supplies from rear
- ↪ Access adapters, processors, memory and systemboard from top
- ↪ Setup Program by pressing F1 at startup
- ↪ Diagnostics (DSA) by pressing F2 at startup
- ↪ SAS Select by pressing Ctrl+C 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: 584GB with four 146GB² 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 10N3059
 - 3 year IOR 24x7, 2 hr avg response 10N3060
 - 4 year IOR 9x5, NBD response 10N3061
 - 5 year IOR 9x5, NBD response 10N3065
- ↪ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Bay ① 5.25", 0.5", access, CD-RW/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

Five available PCI-E x8 slots:
 Slot 1 - full-height, half-length, PCI-E x8
 Slot 2 - full-height, half-length, PCI-E x8
 Slot 3 - full-height, half-length, PCI-E x8
 Slot 4 - full-height, half-length, PCI-E x8
 Slot 5 - full-height, half-length, PCI-E x8

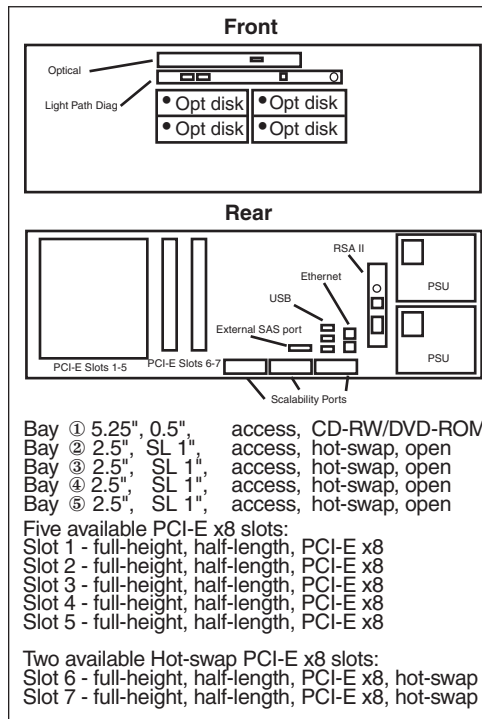
Two available Hot-swap PCI-E x8 slots:
 Slot 6 - full-height, half-length, PCI-E x8, hot-swap
 Slot 7 - full-height, half-length, PCI-E x8, hot-swap

| 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 |
|-----------------|--------------------|---------|----------|--------|------------|--------------|--------|-----------------|------------|----------------------|-----------------------|-----------------|----------------|
| 7233-1LU | 1 x Xeon™ MP E7420 | 2.13GHz | 4 | 2x3MB | 2x2GB | 8 | One | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-2LU | 2 x Xeon MP E7420 | 2.13GHz | 4 | 2x3MB | 4x2GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-4LU | 2 x Xeon MP E7440 | 2.4GHz | 4 | 2x3MB | 4x2GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-5LU | 2 x Xeon MP E7450 | 2.4GHz | 6 | 3x3MB | 8x2GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-6LU | 2 x Xeon MP X7460 | 2.66GHz | 6 | 3x3MB | 8x2GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |

| | |
|----------------------------------|--|
| Processors | Two 64-bit Intel® Xeon™ Processor MP up to 2.66GHz¹ Six-Core / up to 2.13GHz¹ Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T) |
| L2 cache | 6 or 9MB / on-die / at processor speed |
| Processor upgrade Implementation | 4-way SMP / up to four Xeon Processors MP (same speed/cache size) |
| Active Memory™ | 4, 8 or 16GB std / 128GB max per chassis using high-capacity memory card / one, two or four memory cards std (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / 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 | Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1 Optional: ServeRAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup |
| SAS connectors | Controller wired to SAS backplane / external 4x SAS port on rear |
| IDE controller | Enhanced IDE ATA-100 controller in ICH7 South Bridge |
| Disk - capacity | Supports up to 146GB 10K or 73GB 15K rpm disks |
| Disk - bays | Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors |
| Mechanical | EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks |
| Chipset | IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional ServeRAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video) |
| Slots | Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length |
| Optical / diskette | 24x8x ⁶ CD-RW/DVD Combo / none |
| Ethernet | Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 |
| Graphics controller | SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max |
| Ports | Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet Front: two 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 / 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 | Light Path Diagnostics Card / 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/Max: Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / PFA | 2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB) | 41Y2762 |
| 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 | 4GB PC2-5300 CL5 ECC DDR2 RDIMM (2x2GB) | 41Y2771 |
| | | 8GB PC2-5300 CL5 ECC DDR2 RDIMM (2x4GB) | 41Y2768 |
| | | 16GB PC2-5300 CL5 ECC DDR2 RDIMM (2x8GB) | 43V7356 |
| | | IBM Active Memory 8-slot Expansion Card | 44E4252 |
| | | IBM Internal Removable Flash Drive | 44E4251 |
| | | Xeon E7420 2.13GHz/6MB L2/Quad-Core Proc | 44E4469 |
| Xeon E7440 2.13GHz/6MB L2/Quad-Core Proc | 44E4471 | | |
| Xeon E7450 2.4GHz/9MB L2/Six-Core Proc | 44E4472 | | |
| Xeon X7460 2.66GHz/9MB L2/Six-Core Proc | 44E4473 | | |
| IBM ServeRAID-MR10k SAS Controller | 43W4280 | | |
| IBM 73GB 10K 2.5" SAS Hot-swap HDD | 40K1052 | | |
| IBM 146GB 10K 2.5" SAS Hot-Swap HDD | 43X0824 | | |
| IBM 73GB 15K 2.5" SAS Hot-Swap HDD | 43X0837 | | |

Other options at ibm.com/products/us/



- ↪ Dimensions: H6.8" x W17.46" x D28.35"
- ↪ Dimensions: H172mm x W443mm x D720mm
- ↪ Weight: 70 to 95lbs; 31.75 to 43.2kg
- ↪ Stealth black color
- ↪ Tool-free serviceability
- ↪ Access power supplies from rear
- ↪ Access adapters, processors, memory and systemboard from top
- ↪ Setup Program by pressing F1 at startup
- ↪ Diagnostics (DSA) by pressing F2 at startup
- ↪ SAS Select by pressing Ctrl+C at startup
- ↪ Drop Down Light Path Diagnostics (level 2 diagnostic panel) for outside view of potential problem without removing cover
- ↪ Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
- ↪ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

LIMITED WARRANTY³

- ↪ **3 year parts and labor**
- ↪ **International Warranty Service³**
- ↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↪ **On site service upgrade options (in eligible locations):⁷**
 - 3 year IOR 24x7, 4 hr avg response 10N3059**
 - 3 year IOR 24x7, 2 hr avg response 10N3060**
 - 4 year IOR 9x5, NBD response 10N3061**
 - 5 year IOR 9x5, NBD response 10N3065**
- ↪ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↪ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

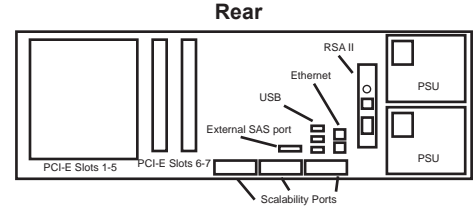
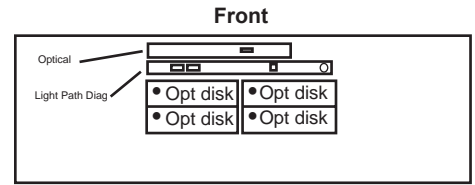
All models: Maximum internal disk capacity: 1.2TB with four 300GB² hot-swap SAS disks

| IBM® Type-model | Qty x Processor | Core | L2 cache | Memory | DIMM slots | Memory cards | RSA II | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date |
|--------------------|--------------------|---------|----------|--------|------------|--------------|--------|-----------------|----------------------|--------------|-----------------------|-----------------|----------------|
| 7141-1SU | 2 x Xeon™ MP E7310 | 1.6GHz | DC 2x2MB | 4x1GB | 16 | Two | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 | Mar 2008 |
| 7141-3SU | 2 x Xeon MP E7330 | 2.4GHz | QC 2x3MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Feb 2008 |
| 7141-4SU | 2 x Xeon MP X7350 | 2.93GHz | QC 2x4MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Feb 2008 |

| | |
|----------------------------------|--|
| Processors | Two 64-bit Intel® Xeon™ MP Processors up to 1.6GHz¹ Dual-Core / up to 2.93GHz¹ Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T) |
| L2 cache | 2 x 2, 2 x 3 or 2 x 4 MB / on-die / at processor speed |
| Processor upgrade Implementation | 4-way SMP / up to four Xeon Processors (same speed/cache/core) per chassis / up to 16-way/64-core (four chassis interconnected) |
| Active Memory™ | 4 or 8GB std / 256GB max per chassis using high-capacity memory card / two or four memory cards standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / 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 | Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1 Optional: ServeRAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup |
| SAS connectors | Controller wired to SAS backplane / external 4x SAS port on rear |
| IDE controller | Enhanced IDE ATA-100 controller in ICH7 South Bridge |
| Disk - capacity | Supports up to 146GB 10K or 73GB 15K rpm disks |
| Disk - bays | Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors |
| Mechanical | EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks |
| Chipset | IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional ServeRAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video) |
| Slots | Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length |
| Optical / diskette | 24x8x ⁶ CD-RW/DVD Combo / none |
| Ethernet | Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 |
| Graphics controller | SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max |
| Ports | Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet Front: two 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 / 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 | Light Path Diagnostics Card / 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) | 2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB) | 41Y2762 |
| Power supplies | Std/Max: Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / PFA | 4GB PC2-5300 CL5 ECC DDR2 RDIMM (2x2GB) | 41Y2771 |
| 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 | 8GB PC2-5300 CL5 ECC DDR2 RDIMM (2x4GB) | 41Y2768 |
| | | 16GB PC2-5300 CL5 ECC DDR2 RDIMM (2x8GB) | 43V7356 |
| | | IBM Active Memory 8-slot Expansion Card | 44E4252 |
| | | IBM Internal Removable Flash Drive | 44E4251 |
| | | Xeon E7310 1.6GHz/4MB L2/Dual Core Proc | 44W2784 |
| | | Xeon E7320 2.13GHz/4MB L2/Quad Core Proc | 44E4241 |
| | | Xeon E7330 2.4GHz/6MB L2/Quad Core Proc | 44E4242 |
| | | Xeon X7350 2.93GHz/8MB L2/Quad Core Proc | 44E4243 |
| | | IBM ServeRAID-MR10k SAS Controller | 43W4280 |
| | | IBM 73GB 10K 2.5" SAS Hot-swap HDD | 40K1052 |
| | | IBM 146GB 10K 2.5" SAS Hot-Swap HDD | 43X0824 |
| | | IBM 73GB 15K 2.5" SAS Hot-Swap HDD | 43X0837 |
| | | IBM ScaleXpander Option Kit (2-3 Node) | 44E4249 |
| | | IBM ScaleXpander Option Kit (4 Node) | 44E4250 |

Other options at ibm.com/products/us/



- Bay ① 5.25", 0.5", access, CD-RW/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

- Five available PCI-E x8 slots:
- Slot 1 - full-height, half-length, PCI-E x8
 - Slot 2 - full-height, half-length, PCI-E x8
 - Slot 3 - full-height, half-length, PCI-E x8
 - Slot 4 - full-height, half-length, PCI-E x8
 - Slot 5 - full-height, half-length, PCI-E x8

- Two available Hot-swap PCI-E x8 slots:
- Slot 6 - full-height, half-length, PCI-E x8, hot-swap
 - Slot 7 - full-height, half-length, PCI-E x8, hot-swap

- ⊙ Dimensions: H6.8" x W17.46" x D28.35"
- ⊙ Dimensions: H172mm x W443mm x D720mm
- ⊙ Weight: 70 to 95lbs; 31.75 to 43.2kg
- ⊙ Stealth black color
- ⊙ Tool-free serviceability
- ⊙ Access power supplies from rear
- ⊙ Access adapters, processors, memory and systemboard from top
- ⊙ Setup Program by pressing F1 at startup
- ⊙ Diagnostics (DSA) by pressing F2 at startup
- ⊙ SAS Select by pressing Ctrl+C 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: 584GB with four 146GB² 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**
ServicePac® part number 10N3059
 - 3 year IOR 24x7, 2 hr avg response**
ServicePac part number 10N3060
 - 4 year IOR 9x5, NBD response**
ServicePac part number 10N3061
 - 5 year IOR 9x5, NBD response**
ServicePac part number 10N3065
- ⇒ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ⇒ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

See footnotes for important warranty information

| IBM® Type-model | Qty x Processor | Core | L2 cache | Memory | DIMM slots | Memory cards | RSA II | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date | |
|--------------------|--------------------|---------|-------------|--------|---------------|-----------------|--------|--------------------|------------|----------------------|--------------------------|--------------------|-------------------|----------|
| 7233-2SU | 2 x Xeon™ MP E7420 | 2.13GHz | 4 | 2x3MB | 4x1GB | 16 | Two | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-5SU | 2 x Xeon MP E7450 | 2.4GHz | 6 | 3x3MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-6SU | 2 x Xeon MP X7460 | 2.66GHz | 6 | 3x3MB | 8x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-7SU | 2 x Xeon MP L7445 | 2.13GHz | 4 | 2x3MB | 4x1GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Oct 2008 |
| 7233-E6U* | 4 x Xeon MP X7460 | 2.66GHz | 6 | 3x3MB | 2x1GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Mar 2009 |
| 7233-4SU | 2 x Xeon MP E7440 | 2.4GHz | 4 | 2x3MB | 4x1GB | 16 | Two | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 | Apr 2009 |

Processors 64-bit Intel® Xeon™ MP Processors up to 2.66GHz¹ Six-Core / up to 2.13GHz¹ Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T)
L2 cache 6 or 9MB std / on-die / at processor speed
Processor upgrade Implementation 4-way SMP / up to four Xeon Processors (same speed/cache/core) per chassis / up to 16-way/64-core (four chassis interconnected) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, two Active™ PCI-E x8 slots, five PCI-E x8 slots and integrated SAS, ethernet, graphics

Active Memory™ 2, 4 or 8GB std / 256GB max per chassis using high-capacity memory card / two or four memory cards standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / 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™)

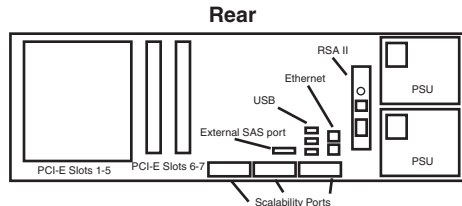
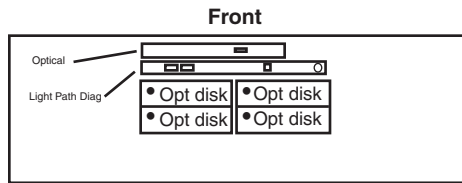
SAS disk controller Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1
 Optional: ServeRAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup
SAS connectors Controller wired to SAS backplane / external 4x SAS port on rear
IDE controller Enhanced IDE ATA-100 controller in ICH7 South Bridge
Disk - capacity Supports up to 146GB 10K or 73GB 15K rpm disks
Disk - bays Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors
Mechanical EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks

Chipset IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional ServeRAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video)
Slots Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length
Optical / diskette 24x8x6 CD-RW/DVD Combo / none
Ethernet Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2
Graphics controller SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max
Ports Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet
 Front: two 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 / 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 Light Path Diagnostics Card / 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/Max: Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / 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

- 2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB) 41Y2762
- 4GB PC2-5300 CL5 ECC DDR2 RDIMM (2x2GB) 41Y2771
- 8GB PC2-5300 CL5 ECC DDR2 RDIMM (2x4GB) 41Y2768
- 16GB PC2-5300 CL5 ECC DDR2 RDIMM (2x8GB) 43V7356
- IBM Active Memory 8-slot Expansion Card 44E4252
- IBM Internal Removable Flash Drive 44E4251
- Xeon E7420 2.13GHz/6MB L2/Quad-Core Proc 44E4469
- Xeon E7430 2.13GHz/6MB L2/Quad-Core Proc 44E4470
- Xeon L7445 2.13GHz/6MB L2/Quad-Core Proc 44E4517
- Xeon E7450 2.4GHz/9MB L2/Six-Core Proc 44E4472
- Xeon E7440 2.4GHz/9MB L2/Six-Core Proc 44E4471
- Xeon X7460 2.66GHz/9MB L2/Six-Core Proc 44E4473
- IBM ServeRAID-MR10k SAS Controller 43W4280
- IBM 73GB 10K 2.5" SAS Hot-swap HDD 40K1052
- IBM 146GB 10K 2.5" SAS Hot-Swap HDD 43X0824
- IBM 73GB 15K 2.5" SAS Hot-Swap HDD 43X0837
- IBM ScaleXpander Option Kit (2-3 Node) 44E4249
- IBM ScaleXpander Option Kit (4 Node) 44E4250
- Other options at ibm.com/products/us/



- Bay ① 5.25", 0.5" access, CD-RW/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

- Five available PCI-E x8 slots:
 Slot 1 - full-height, half-length, PCI-E x8
 Slot 2 - full-height, half-length, PCI-E x8
 Slot 3 - full-height, half-length, PCI-E x8
 Slot 4 - full-height, half-length, PCI-E x8
 Slot 5 - full-height, half-length, PCI-E x8

- Two available Hot-swap PCI-E x8 slots:
 Slot 6 - full-height, half-length, PCI-E x8, hot-swap
 Slot 7 - full-height, half-length, PCI-E x8, hot-swap

- Dimensions: H6.8" x W17.46" x D28.35"
- Dimensions: H172mm x W443mm x D720mm
- Weight: 70 to 95lbs; 31.75 to 43.2kg
- Stealth black color
- Tool-free serviceability
- Access power supplies from rear
- Access adapters, processors, memory and systemboard from top
- Setup Program by pressing F1 at startup
- Diagnostics (DSA) by pressing F2 at startup
- SAS Select by pressing Ctrl+C 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: 584GB with four 146GB² hot-swap SAS disks

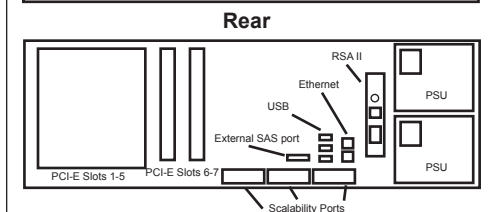
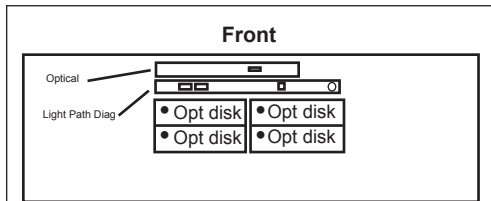
LIMITED WARRANTY³

- 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 ServicePac® part number 10N3059
 - 3 year IOR 24x7, 2 hr avg response ServicePac part number 10N3060
 - 4 year IOR 9x5, NBD response ServicePac part number 10N3061
 - 5 year IOR 9x5, NBD response ServicePac part number 10N3065
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Qty x Processor | Core | L2 cache | Memory | DIMM slots | Memory cards | RSA II | Disk controller | Mechanical | Slots x bays | Hot-swap pwr supplies | Warranty (yrs.) | Available date |
|--------------------|--------------------|---------|-------------|--------|---------------|-----------------|--------|--------------------|------------|----------------------|--------------------------|--------------------|-------------------|
| 7233-2MU | 2 x Xeon™ MP E7420 | 2.13GHz | 4 | 2x3MB | 4x2GB | 16 | Two | Std | SAS | 4U ⁴ rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-4MU | 2 x Xeon MP E7440 | 2.4GHz | 4 | 2x3MB | 4x2GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-5MU | 2 x Xeon MP E7450 | 2.4GHz | 6 | 3x3MB | 8x2GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |
| 7233-6MU | 2 x Xeon MP X7460 | 2.66GHz | 6 | 3x3MB | 8x2GB | 32 | Four | Std | SAS | 4U rack | 7x5 | 2 x 1440W | 3 Aug 2009 |

| | |
|----------------------------------|---|
| Processors | Two 64-bit Intel® Xeon™ MP Processors up to 2.66GHz¹ Six-Core / up to 2.4GHz² Four-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T) |
| L2 cache | 6 or 9MB std / on-die / at processor speed |
| Processor upgrade Implementation | 4-way SMP / up to four Xeon Processors (same speed/cache/core) per chassis / up to 16-way/64-core (4 chassis interconnected) System board contains four Intel 604-pin micro-PGA4 ZIF sockets, four memory board slots, two Active™ PCI-E x8 slots, five PCI-E x8 slots and integrated SAS, ethernet, graphics |
| Active Memory™ | 8 or 16GB std / 256GB max per chassis using high-capacity memory card / two or four memory cards standard (up to four) with 8 DIMM gold-connector slots each / DIMMs must be installed in matched pairs / PC2-5300 667MHz registered 240-pin DDR2-SDRAM DIMMs / 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 | Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1 Optional: Server RAID™ 10k / RAID 5, 5E, 50 & 6 / dedicated slot / dimm / battery backup |
| SAS connectors | Controller wired to SAS backplane / external 4x SAS port on rear |
| IDE controller | Enhanced IDE ATA-100 controller in ICH7 South Bridge |
| Disk - capacity | Supports up to 146GB 10K or 73GB 15K rpm disks |
| Disk - bays | Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors |
| Mechanical | EIA 19" rack models (4U⁴) x 28" deep / supported in NetBAY™ Racks |
| Chipset | IBM X4™ 4th Generation chipset / Integrated Processor and Memory Controller / Scalable from 4 to 16 sockets / Supports EM64T / provides 7 PCI-E x8 slots / supports optional Server RAID Xi / Intel® I/O Controller Hub 7 (ICH7) South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video) |
| Slots | Two Active™ PCI-E x8 slots / 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 / Five PCI-E x8 slots / all full height, half length |
| Optical / diskette | 24x8x ⁶ CD-RW/DVD Combo / none |
| Ethernet | Broadcom® 5709C 10/100/1000 dual ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 |
| Graphics controller | SVGA / ATI® RN50 (ES1000) / on planar / 16MB SDRAM std/max |
| Ports | Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet Front: two 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 / 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 | Light Path Diagnostics Card / 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) | 2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB) | 41Y2762 |
| Power supplies | Std/Max: Two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / PFA | 4GB PC2-5300 CL5 ECC DDR2 RDIMM (2x2GB) | 41Y2771 |
| 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 | 8GB PC2-5300 CL5 ECC DDR2 RDIMM (2x4GB) | 41Y2768 |
| | | 16GB PC2-5300 CL5 ECC DDR2 RDIMM (2x8GB) | 43V7356 |
| | | IBM Active Memory 8-slot Expansion Card | 44E4252 |
| | | IBM Internal Removable Flash Drive | 44E4251 |
| | | Xeon E7420 2.13GHz/6MB L2/Quad-Core Proc | 44E4469 |
| | | Xeon E7430 2.13GHz/6MB L2/Six-Core Proc | 44E4470 |
| | | Xeon L7445 2.13GHz/6MB L2/Quad-Core Proc | 44E4517 |
| | | Xeon E7450 2.4GHz/9MB L2/Six-Core Proc | 44E4472 |
| | | Xeon E7440 2.4GHz/9MB L2/Six-Core Proc | 44E4471 |
| | | Xeon X7460 2.66GHz/9MB L2/Six-Core Proc | 44E4473 |
| | | IBM ServeRAID-MR10k SAS Controller | 43W4280 |
| | | IBM 73GB 10K 2.5" SAS Hot-swap HDD | 40K1052 |
| | | IBM 146GB 10K 2.5" SAS Hot-Swap HDD | 43X0824 |
| | | IBM 73GB 15K 2.5" SAS Hot-Swap HDD | 43X0837 |
| | | IBM ScaleXpander Option Kit (2-3 Node) | 44E4249 |
| | | IBM ScaleXpander Option Kit (4 Node) | 44E4250 |
| | | Other options at ibm.com/products/us/ | |



- Bay ① 5.25", 0.5" access, CD-RW/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
- Five available PCI-E x8 slots:
- Slot 1 - full-height, half-length, PCI-E x8
 - Slot 2 - full-height, half-length, PCI-E x8
 - Slot 3 - full-height, half-length, PCI-E x8
 - Slot 4 - full-height, half-length, PCI-E x8
 - Slot 5 - full-height, half-length, PCI-E x8
- Two available Hot-swap PCI-E x8 slots:
- Slot 6 - full-height, half-length, PCI-E x8, hot-swap
 - Slot 7 - full-height, half-length, PCI-E x8, hot-swap

- ↳ Dimensions: H6.8" x W17.46" x D28.35"
 - ↳ Dimensions: H172mm x W443mm x D720mm
 - ↳ Weight: 70 to 95lbs; 31.75 to 43.2kg
 - ↳ Stealth black color
 - ↳ Tool-free serviceability
 - ↳ Access power supplies from rear
 - ↳ Access adapters, processors, memory and systemboard from top
 - ↳ Setup Program by pressing F1 at startup
 - ↳ Diagnostics (DSA) by pressing F2 at startup
 - ↳ SAS Select by pressing Ctrl+C 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 300GB² hot-swap SAS disks

LIMITED WARRANTY³

- ↳ **3 year parts and labor**
- ↳ **International Warranty Service³**
- ↳ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↳ **On site service upgrade options (in eligible locations):⁷**
 - 3 year IOR 24x7, 4 hr avg response** ServicePac® part number 10N3059
 - 3 year IOR 24x7, 2 hr avg response** ServicePac part number 10N3060
 - 4 year IOR 9x5, NBD response** ServicePac part number 10N3061
 - 5 year IOR 9x5, NBD response** ServicePac part number 10N3065
- ↳ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↳ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

See footnotes for important warranty information

| IBM® Type-model | Supported Blades | Blade servers std/max | Switch modules std/max | Switch modules (type) | Management modules std/max | Power modules std/max | Power module Wattage | Blower modules std/max | Mechanical | Available date |
|---------------------------------|--|-----------------------|------------------------|------------------------|----------------------------|-----------------------|----------------------|------------------------|----------------------|----------------|
| 8677-3RX** | HC10/HS12/HS20/HS21/HS21XM/HS22/HS40/JS12/JS20/JS21/LS20/LS21/LS22/LS41/LS42/QS20 | 0/14 | 0/4 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 2/4 | 2000W | 2/2 | 7U ⁴ rack | Mar 2006 |
| 8677-3SX** | HC10/HS12/HS20/HS21/HS21XM/HS22HS40/JS12/JS20/JS21/JS22/LS20/LS21/LS22/LS40/LS41/LS42/QS20/QS22 | 0/14 | 0/4 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 2/4 | 2000W | 2/2 | 7U rack | Mar 2009 |
| 8677-4SX | HC10/HS12/HS20/HS21/HS21XM/HS22HS40/JS12/JS20/JS21/JS22/LS20/LS21/LS22/LS40/LS41/LS42/QS20/QS22 | 0/14 | 0/4 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 2/4 | 2320W | 2/2 | 7U rack | Mar 2009 |
| 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 storage, switching and connectivity, and I/O (diskette(some), optical drive(some), and ports for USB, keyboard, video, mouse) | | | | | | | | | |
| Blade bays | 14 hot-swappable bays / front access / supports most Blade servers and all Blade expansion units | | | | | | | | | |
| Switch modules | Std/max: none/four / hot-swap / rear access / SAS / Gb Ethernet / Fibre Channel / InfiniBand / Optical & Copper Pass-thru | | | | | | | | | |
| Advanced Management module | Std/max: one/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, two USB 2.0, Serial(RJ45),10/100 ethernet remote management connection port / all ports shared by up to 14 Blade servers | | | | | | | | | |
| Power modules | Std/max: two/four in bays 1 and 2 (two 9ft IEC 320-C13 to C14 or two IEC 320-C19 to C20 cables for intrarack power distribution) / hot-swap / rear access / 2000W(3RX & 3SX) at 220v / 2320W(4SX) 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 | | | | | | | | | |
| Blower modules | Std/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 3RX: 8X-24X ⁶ DVD-ROM / 3.5" 1.44MB diskette drive / one USB port (Version 1.1) / fixed / front access / shared by up to 14 Blade servers / requests for optical, diskette and USB port by pressing media select button on server blade front panel 3SX & 4SX: CD/DVD-RW Multiburner / no diskette / filler plates std / one USB port (Version 2.0) / fixed / front access / shared by up to 14 Blade servers / requests for optical and USB port by pressing media select button on server blade front panel | | | | | | | | | |
| Keyboard / mouse | None standard / provides KVM console support / requests for keyboard, video and mouse by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions | | | | | | | | | |
| Ports | Rear: two USB 2.0 (keyboard & mouse), DB-15 graphics, two RJ45 (Serial, 10/100 ethernet remote mgmt connection port) / all on Advanced Management module and shared by up to 14 Blade servers / no serial or parallel ports Front: one USB (3RX Version 1.1) (3SX & 4SX Version 2.0) | | | | | | | | | |
| 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 <i>Gigabit Ethernet Switch Module</i> (the second ethernet controller requires a second optional <i>Gigabit Ethernet Switch Module</i>) | | | | | | | | | |
| Systems mgmt | Provides remote console and mgmt / power on/off Blades/modules / monitors realtime 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 |
| IBM 2320W Power Supply Option (incl. two modules)(3SX & 4SX only) | 46M0508 | APC Smart-UPS 5000RMB (208V) | 37L6861 |
| IBM 2000W Power Supply Option (incl. two modules)(3RX only) | 26K4816 | Other options at ibm.com/products/us | |

Front

Rear

- ↳ Dimensions: H12.0" x W17.5" x D28"
- ↳ Dimensions: H304.2mm x W444mm x D711.2mm
- ↳ Weight: 99 to 240 lb; 44.91 to 108.86kg
- ↳ Stealth black color bezel
- ↳ Tool-free customer serviceability
- ↳ Access server blades and SCSI Expansion Units from front
- ↳ Access modules from rear
- ↳ Midplane in center of system to interface for all major system components
- ↳ Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

| Switch Module | Switch Module function |
|---------------|---|
| 1 | Ethernet link 1 for all blade servers |
| 2 | Ethernet link 2 for all blade servers |
| 3 | Network connection 1 for all blade server I/O expansion options (Fibre Channel) |
| 4 | Network connection 2 for all blade server I/O expansion options (Fibre Channel) |

LIMITED WARRANTY³

- ↳ 3 year parts and labor
- ↳ International Warranty Service³
- ↳ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↳ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 51J8882)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 61P7613)
 - 3 year IOR 9x5, NBD response (ServicePac part num 51J8880)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 51J8885)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 51J8884)
 - 5 year IOR 9x5, NBD response (ServicePac part num 51J8886)
- ↳ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↳ 24x7¹² toll-free support for warranty issues during the warranty period³

**Limitations
HS21(4C) - up to 80W models only, HS21 XM (2C & 4C) - up to 80W models only
LS21/41 - up to 68W models only, LS22/42 - except 115W models

| 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 | Blower modules Mechanical | Available date |
|-----------------------------|--|-------------------------|--------------------------|------------------------|---------------------------------------|-------------------------|----------------------|--------------------------|---------------------------|----------------|
| 8852-4XX | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/QS21/QS22 | 0/14 | 0/4 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 2/4 | 2900W | 2/2 | 9U ⁴ rack | Mar 2006 |
| 8852-4SX | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/QS21/QS22 | 0/14 | 0/4 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 2/4 | 2900W | 2/2 | 9U rack | Aug 2009 |
| Positioning Description | Revolutionary design provides the most efficient infrastructure building block for adding scale and capacity Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel switching and connectivity, and I/O | | | | | | | | | |
| Blade bays | Supports all blades and Blade Expansion Units / 14 hot-swappable bays / front access | | | | | | | | | |
| Switch modules | Std/max: none/ten / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru | | | | | | | | | |
| Advanced Management Modules | Std/max: one/two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port | | | | | | | | | |
| Power modules | Std: two; max: four / hot-swap / front access / 2900 watts at 220V / redundant within pair (N+N redundancy) / two std modules supply power to blade bays 1 through 7 and both AMMs, SMs 1 & 2, and all fans / two optional modules in bays 3 and 4 required if blade bays 8-14 or IO bays 5-10 used / worldwide / voltage-sensing / auto-restart / 3 fans per power module | | | | | | | | | |
| Blower modules | Std/max: two / hot-swap / redundant / variable speed / 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) 4XX: DVD-ROM / two USB ports (Version 2.0) / Full Light Path Diagnostic panel / customer serviceable / front access / shared by all blade servers / requests for optical and USB port by pressing DVD select button on server blade front panel 4SX: Two USB ports (Version 2.0) / optional DVD Multiburner / Full Light Path Diagnostic panel / customer serviceable / front access / shared by all blade servers / requests for optical and USB port by pressing media select button on server blade front panel | | | | | | | | | |
| Keyboard / mouse | None standard / USB / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions | | | | | | | | | |
| Ports | Rear: two USB, two RJ45 (one ethernet and one serial), analog DB-15 graphics (on advanced mgmt module) / one serial aggregate for break out cable; Front: two USB (Media Tray) | | | | | | | | | |
| Security | Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures | | | | | | | | | |
| Ethernet | Dual integrated gigabit ethernet controllers on each blade connects to optional <i>GB Ethernet Switch Module</i> | | | | | | | | | |
| Systems management | 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 / | | | | | | | | | |

| | | | |
|--|---------|---|---------|
| 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 | | |
| NetBAY42 Enterprise Rack Cabinet | | Other options at ibm.com/products/us Solutions available from IBM BladeCenter Alliance program partners | |

Front

Rear

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

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

LIMITED WARRANTY³

- ↪ **3 year parts and labor**
- ↪ **International Warranty Service³**
- ↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↪ **On site service upgrade options (in eligible locations):⁷**
 - 3 year IOR 24x7, 2 hr avg response** (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 4 hr avg response** (ServicePac part num 21P2085)
 - 3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41L2736)
 - 5 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9207)
 - 5 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9209)
- ↪ **Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↪ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

| IBM® Type-model | Supported Blades | Blade Servers std/max | Switch modules std/max | Switch modules (type) | Advanced | | | | Blower modules std/max | Mechanical | Available date |
|-----------------------|---|--------------------------|---------------------------|------------------------|----------------------------|-------------------------|--------------------------|-------------------------|---------------------------|----------------------|----------------|
| | | | | | Storage modules std/max | Mgmt modules std/max | Power modules std/max | Power Module Wattage | | | |
| 8886-1MX | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS41/LS42/QS21/QS22 | 0/6 | 0/3 | SAS/Enet/FC/IB/OPM/CPM | 0/2 | 1/1 | 2/4 | 950/1450W | 4/4 | 7U ⁴ rack | Dec 2007 |
| 8886-E1X ¹ | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS41/LS42/QS21/QS22 | 0/6 | 1/3 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 1/1 | 4/4 | 950/1450W | 4/4 | 7U ⁴ rack | Dec 2007 |
| 8886-1TX | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS41/LS42/QS21/QS22 | 0/6 | 0/3 | SAS/Enet/FC/IB/OPM/CPM | 0/2 | 1/1 | 2/4 | 950/1450W | 4/4 | 7U ⁴ rack | Aug 2009 |
| 8886-ETX ¹ | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS41/LS42/QS21/QS22 | 0/6 | 1/3 | SAS/Enet/FC/IB/OPM/CPM | 0/2 | 1/1 | 4/4 | 950/1450W | 4/4 | 7U ⁴ rack | Aug 2009 |
| 8886-EVX ¹ | HC10/HS12/HS20/HS21/HS21XM/HS22/JS12/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS41/LS42/QS21/QS22 | 0/6 | 1/3 | SAS/Enet/FC/IB/OPM/CPM | 1/2 | 1/1 | 4/4 | 950/1450W | 4/4 | 7U ⁴ rack | Aug 2009 |

Positioning Description *Greatly Improved BladeCenter Platform for Small Office Environment with Integrated Storage*
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

Blade bays Supports all blades and Blade Expansion Units / 6 hot-swappable bays / front access
Switch modules Std/max: none/ten / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru
Storage modules Std: some: one; some: none; max: two / front access / 2 power supplies required per module / each module supports six hot-swap 3.5" SAS and SATA HDD's
Advanced Management Modules Std/max: one / 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 / rear access / 1450 watts at 220V / 950 watts at 110V / redundant within pair (N+N redundancy) / worldwide / voltage-sensing / auto-restart / 2 fans per power module / modules 1 and 2 standard / modules 3 and 4 required with 2nd Storage module installed
Blower modules Std/max: four / hot-swap / redundant / variable speed / rear access / front to back airflow

Mechanical EIA 19" rack models (7U⁴) x 29" deep / supported in NetBAY™ Racks (such as NetBAY42 ER)
Media Tray 1MX&E1X: DVD-ROM / two USB ports (Version 2.0) / Full Light Path Diagnostic panel / customer serviceable / front access / shared by all blade servers / requests for optical and USB port by pressing DVD select button on server blade front panel
 1TX, ETX&EVX: Two USB ports (Version 2.0) / optional DVD Multiburner / Full Light Path Diagnostic panel / customer serviceable / front access / shared by all blade servers / requests for optical and USB port by pressing media select button on server blade front panel

Keyboard / mouse None standard / USB / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel / supports NetBAY ACT CAT5 chaining solutions
Ports Rear: two USB, two RJ45 (one ethernet and one serial), analog DB-15 graphics (on advanced mgmt module) / one serial aggregate for break out cable; Front: two USB (Media Tray)

Security Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures
Ethernet Dual integrated gigabit ethernet controllers on each blade connects to optional GB Ethernet Switch Module
Systems management 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 Provides power-on, location, over-temperature, information, and system-error conditions

| | | | |
|---|---------|--|---------|
| Brocade 10-port Switch Module for IBM BladeCenter | 32R1813 | BladeCenter S 6-Disk Storage Module | 43W3581 |
| Cisco Systems 4Gb 10-port Fibre Channel Switch Module | 39Y9284 | BladeCenter S 950W/1450W Auto-Sensing Power Supplies 3 & 4 | 43W3582 |
| QLogic 4Gb FC 10-port Full Fabric Switch | 43W6724 | BladeCenter S Serial Pass-thru module | 43W3583 |
| IBM BladeCenter SAS Connectivity Module | 39Y9195 | IBM DPI C19 PDU+C19 without line cord | 39M2818 |
| IBM BladeCenter Optical Pass-thru module | 39Y9316 | IBM DPI C19 3 Phase PDU+C19 with attached line cord | 39M2819 |
| IBM BladeCenter Copper Pass-thru module | 39Y9320 | DPI 60A Three Phase C19 Enterprise PDU with IEC309 3P+G (208V) fixed line cord | 39Y8923 |
| IBM BladeCenter PCI Expansion Unit 2 | 25K8373 | DPI 60A Single Phase C19 Enterprise PDU w/o line cord | 39Y8948 |
| IBM BladeCenter PCI I/O Expansion Unit | 43W6692 | | |
| 750GB DP HS SATA HDD | 43W7580 | | |
| IBM Server 73GB 15K SAS HS | 43W7523 | | |
| IBM Server 146GB 15K SAS HS | 43W7524 | | |
| 300GB SAS 15K HS | 43X0802 | | |
| 500GB SATA2 HDD | 39M4558 | | |

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

Front

Disk Storage Module bays

Media Tray

Server Blade 1

Server Blade 2

Server Blade 3

Server Blade 4

Server Blade 5

Server Blade 6

Rear

G3

F

F

D

C

A

G1

G4

F

F

E

C

B

G2

⊖ Dimensions: H12" x W17.5" x D28.9"
 Dimensions: H306.3mm x W440mm x D733.4mm
 ⊖ Weight: 90 to 240 lb; 40.82 to 108.86kg
 ⊖ Stealth black color bezel
 ⊖ Tool-free customer serviceability
 ⊖ Access server blades, battery backup units, media tray and storage modules from front
 ⊖ Access AMM, expansion modules, blower and power modules from rear
 ⊖ Midplane in center of system to interface for all system components
 ⊖ Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

A • Advanced Management Module
B • Serial Module Bay
C • I/O Module Bays 3 & 4
D • I/O Module Bay 1 - for ethernet switch
E • I/O Module Bay 2 - for future use
F • Blower Modules (4) std
G • Power Module Slots - G1&G2 std / G3&G4 opt

LIMITED WARRANTY³

- ↪ 3 year parts and labor
- ↪ International Warranty Service³
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↪ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 46D3900)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 46D3899)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 46D3898)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 46D3906)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 46D3908)
- ↪ Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↪ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

¹ Express Model

IBM BladeCenter® T 8720 (DC power)

xREF by STG Field Skills and Education Team

| IBM® Type-model | Supported Blades | Blade Servers std / max | Switch modules std / max | Switch modules (type) | Management modules std / max | Power modules std / max | Power Module Wattage | Blower modules std / max | Mechanical | Available date |
|----------------------------|---|-------------------------|--------------------------|---------------------------------|------------------------------|-------------------------|----------------------|--------------------------|----------------------|----------------|
| 8720-1RX | HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41** | 0 / 8 | 0 / 4 | Enet, Fibre Ch, IB, OPM and CPM | 1 / 2 | 2 / 4 | 1300W | 4 / 4 | 8U ⁴ rack | Jul 2004 |
| 8720-2RX | HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41** | 0 / 8 | 0 / 4 | Enet, Fibre Ch, IB, OPM and CPM | 1 / 2 | 2 / 4 | 1300W | 4 / 4 | 8U rack | Mar 2006 |
| Positioning Description | Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (combo CD/DVD drive, and ports for USB, keyboard, video, mouse) | | | | | | | | | |
| Blade bays | Supports all blades and PCI I/O Expansion Blades / 8 hot-pluggable server bays / front access | | | | | | | | | |
| Switch modules | Std: none; max: four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru | | | | | | | | | |
| Advanced Management Module | Std: none; max: two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers | | | | | | | | | |
| Power modules | Std: two in bays 1 and 2, max: four / hot-swap / front access / input voltage range -48V - 60V (Min/Max) at 50/60Hz / two IEC320 C14 male appliance connector / 1300 watts / two std modules (in slots 1 & 2) supply power to switch bays 1 & 2, both management modules, blade bays 1 - 4 and media tray; two additional power modules provide full system redundant power and power to switch bays 3 & 4, and blade bays 5 - 8 All: load balancing / voltage-sensing / auto-restart | | | | | | | | | |
| Blower modules | Std: four; max: four / Calibrated Vectedored Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake | | | | | | | | | |
| Mechanical Optical / USB | EIA 19" rack models (8U⁴) x 20" deep / designed for EIA-310D and UTF Four Post Racks 24X-10X-24X-8X ⁶ Combo / Two USB port (Version 1.1) / all USB interface (types A & C) / front access / shared by up to eight blade servers / requests for optical cd and USB port(s) by pressing CD select button on server blade front panel | | | | | | | | | |
| Keyboard / mouse | None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel | | | | | | | | | |
| Ports | Rear: keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / DB-15 Telco Alarm Panel Front: two USB (Version 1.1) / | | | | | | | | | |
| Security | Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures | | | | | | | | | |
| Ethernet | Each of the dual integrated gigabit ethernet controllers on each blade servers connects to an optional 4-port GB Ethernet Switch Module | | | | | | | | | |
| Systems mgmt | Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software | | | | | | | | | |
| System LED panel | System LED panel provides power-on, location, critical, major and minor alarm conditions | | | | | | | | | |

| | | | |
|--|---------|--|---------|
| IBM BladeCenter T Advanced Management Module | 32R0835 | IBM 1300W DC Power Supply Module (x2) | 32R0833 |
| McData EFCM Element Manager for BladeCenter | 32R1799 | IBM APC Smart-UPS 5000RMB (208V) | 37L6861 |
| IBM BladeCenter HS20 Low Profile Handle (800Mhz blade) | 25K8360 | IBM T115 15" Flat Panel Color Monitor (black) | 494215U |
| IBM BladeCenter HS40 Low Profile Handle | 25K8359 | BladeCenter PCI I/O Expansion Unit II | 25K8373 |
| IBM BladeCenter T Filter | 25K8376 | IBM DS4000 EXP700 Fibre Channel Expansion Unit | 17001RS |
| NetBAY42 Enterprise Rack Cabinet | 930842S | IBM USB Floppy Drive | 05K9276 |
| Four Post Rack Mount Kit | 32R0837 | | |
| Two Post Rack Mount Kit | 32R0836 | | |

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

Front

Dimensions: H13.76"(8U) x W17.4" x D20"(front bezel to rear I/O); H349.5mm x W441.9mm x D508mm

Weight: 98 to 192 lb; 44.5 to 87.38kg

- Stealth black color bezel
- Tool-free customer serviceability
- Access server blades, power supplies, mgmt modules, media tray and expansion units from front
- Access switch modules and blowers from rear
- Fits into Standard Central Office environments
- Air Intake Filtering
- Predictive Failure Analysis® alerts on blowers, blade server memory, processor(s), and optional disk(s) with IBM Director

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9205)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Rear

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

| IBM® Type-model | Supported Blades | Blade Servers std / max | Switch modules std / max | Switch modules (type) | Management modules std / max | Power modules std / max | Power Module Wattage | Blower modules std / max | Mechanical | Available date |
|----------------------------|--|-------------------------|--------------------------|---------------------------------|------------------------------|-------------------------|----------------------|--------------------------|----------------------|----------------|
| 8730-1RX | HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41** | 0 / 8 | 0 / 4 | Enet, Fibre Ch, IB, OPM and CPM | 1 / 2 | 2 / 4 | 1300W | 4 / 4 | 8U ⁴ rack | Jul 2004 |
| 8730-2RX | HS20/HS21**/HS40/JS20/JS21/LS20/LS21**/LS41** | 0 / 8 | 0 / 4 | Enet, Fibre Ch, IB, OPM and CPM | 1 / 2 | 2 / 4 | 1300W | 4 / 4 | 8U rack | Mar 2006 |
| Positioning Description | Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external Fibre Channel storage switching and connectivity, and I/O (combo CD-RW/DVD and ports for USB, keyboard, video, mouse) | | | | | | | | | |
| Blade bays | Supports all blades and PCI I/O Expansion Units / 8 hot-pluggable server bays / front access | | | | | | | | | |
| Switch modules | Std: none; max: four / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru | | | | | | | | | |
| Advanced Management Module | Std: none; max: two / hot-swap / rear access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers | | | | | | | | | |
| Management Modules | Std: one; max: two / hot-swap / rear access (I/O ports) / comprehensive system management functions / PowerPC® 401 controller / communicates with integrated system management processor on each server blade / multiplexor for console connectivity / controls external Telco alarm panel / ports: DB-15 analog video port, PS/2 keyboard port, PS/2 mouse port, 10/100 ethernet remote management connection port / all ports shared by up to 8 blade servers | | | | | | | | | |
| Power modules | Std: two in bays 1 and 2, max: four / hot-swap / front access / input voltage range 180VAC - 264VAC (Min/Max) at 50/60Hz / two IEC320 C14 male appliance connector / 1300 watts / two std modules (in slots 1 & 2) supply power to switch bays 1 & 2, both management modules, blade bays 1 - 4 and media tray; two additional power modules provide full system redundant power and power to switch bays 3 & 4, and blade bays 5 - 8 All: load balancing / voltage-sensing / auto-restart | | | | | | | | | |
| Blower modules | Std: four; max: four / Calibrated Vectedored Cooling / hot-swap / redundant / variable speed / rear access / 330 cubic ft per min (CFM) / front to back airflow; filtered air intake | | | | | | | | | |
| Mechanical Optical / USB | EIA 19" rack models (8U⁴) x 20" deep / designed for EIA-310D (types A & C) and UTF four post racks 24X-10X-24X-8X ⁶ Combo / Two USB port (Version 1.1) / all USB interface / front access / shared by up to eight blade servers / requests for optical CD, and USB port(s) by pressing CD select button on blade server front panel | | | | | | | | | |
| Keyboard / mouse | None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel | | | | | | | | | |
| Ports | Rear: keyboard (PS/2), mouse (PS/2), analog DB-15 graphics (on standard mgmt module) / no serial or parallel ports / DB15 Telco Alarm Panel Front: Two USB (Version 1.1) | | | | | | | | | |
| Security | Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures | | | | | | | | | |
| Ethernet | Each of the dual integrated gigabit ethernet controllers on each blade server connects to an optional <i>GB Ethernet Switch Module</i> | | | | | | | | | |
| Systems mgmt | Provides remote console and mgmt / power on/off blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software | | | | | | | | | |
| System LED panel | System LED panel provides power-on, location, critical, major and minor alarm conditions | | | | | | | | | |

| | | | |
|--|---------|---|---------|
| IBM BladeCenter T Advanced Management Module | 32R0835 | IBM 1300W AC Power Supply Module (x2) | 32R0834 |
| McData EFCM Element Managerfor BladeCenter | 32R1799 | IBM APC Smart-UPS 5000RMB (208V) | 37L6861 |
| IBM BladeCenter HS20 Low Profile Handle (800Mhz blade) | 25K8360 | IBM T115 15" Flat Panel Color Monitor (black) | 494215U |
| IBM BladeCenter HS40 Low Profile Handle | 25K8359 | BladeCenter PCI I/O Expansion Unit | 25K8373 |
| IBM BladeCenter T Filter | 25K8376 | IBM DS4000 EXP700 Fibre Channel Expansion Unit | 17001RS |
| NetBAY42 Enterprise Rack Cabinet | 930842S | IBM USB Floppy Drive | 05K9276 |
| Four Post Rack Mount Kit | 32R0837 | | |
| Two Post Rack Mount Kit | 32R0836 | | |
| | | • Other options at ibm.com/products/us | |
| | | • Solutions available from IBM BladeCenter Alliance program partners | |

Front

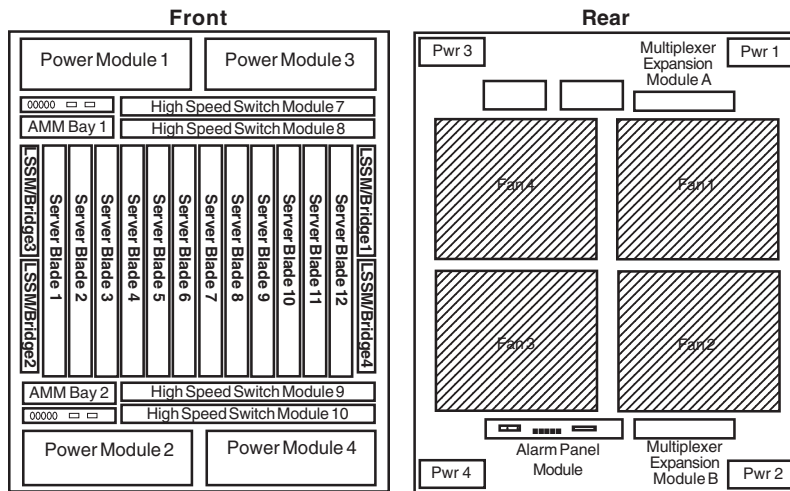
Rear

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

LIMITED WARRANTY³

- ↔ **3 year parts and labor**
- ↔ **International Warranty Service³**
- ↔ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷**
- ↔ **On site service upgrade options (in eligible locations):⁷**
 - **3 year IOR 24x7, 2 hr avg response** (ServicePac® part num 21P2065)
 - **3 year IOR 24x7, 4 hr avg response** (ServicePac part num 30L9185)
 - **3 year IOR 9x5, 4 hr avg response** (ServicePac part num 41L2736)
 - **5 year IOR 9x5, 4 hr avg response** (ServicePac part num 69P9207)
 - **5 year IOR 24x7, 2 hr avg response** (ServicePac part num 69P9205)
- **Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↔ **24x7¹⁴ toll-free support for warranty issues during the warranty period³**

| IBM® Type-model | Supported Blades | Blade Servers std / max | Switch modules std / max | Switch modules (type) | Advanced Management modules std / max | Power modules std / max | Power module Wattage | Fan modules std / max | Mechanical | Available date |
|-----------------------------|---|-------------------------|--------------------------|---|---------------------------------------|-------------------------|----------------------|-----------------------|-----------------------|----------------|
| 8750-1RX | HS20/HS21/JS20/JS21/LS20/LS21/LS41/AMC/NGW | 0 / 12 | 0 / 8 | Enet, 10Gb Enet, Fibre Ch, IB, 4X IB, OPM and CPM | 1 / 2 | 2 / 4 | 2535W (DC -48V) | 4 / 4 | 12U ⁴ rack | Jun 2007 |
| Positioning Description | Leadership High Speed, High Performance, carrier grade blade platform for Next Generation Network applications | | | | | | | | | |
| Blade bays | Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external storage switching and connectivity, and I/O (USB and video) Supports all blades and Blade Expansion Units / 12 hot-swappable bays / front access | | | | | | | | | |
| High Speed Switch Modules | Std: none; max: four/ hot-swap / front access / 10Gb Ethernet / 4X InfiniBand / Copper 4X Pass-thru | | | | | | | | | |
| Legacy SwitchModules | Std: none; max: four/ hot-swap / front access / Gb Eth / 10Gb Eth uplink / 4Gb Fibre Channel / 4X InfiniBand uplink / Optical Pass-thru / Copper Pass-thru / | | | | | | | | | |
| Advanced Management Modules | Std: one; max: two / hot-swap / front access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port | | | | | | | | | |
| Power Modules | Std: two; max: four / hot-swap / front access / input voltage range -48VDC to -60VDC (Min/Max) / redundant within pair (N+N redundancy) / power modules 1 and 2 support blade bays 1- 6, all legacy switch and bridge modules, upper and lower media trays, both advanced management modules, multiplexer expansion modules and alarm panel module / power modules 3 and 4 support blade bays 7-12 and all High Speed Switch Modules / worldwide / auto-restart / 3 fans per power module | | | | | | | | | |
| Fan Modules | Std/max: four / hot-swap / redundant / speed controlled according to ambient air temperature / rear access / front to back airflow | | | | | | | | | |
| Mechanical | EIA 19" rack models (12U⁴) x 706mm deep / supported in NetBAY™ Racks with seismic bracing | | | | | | | | | |
| Media Tray | Std: one; max: two / two USB 2.0 ports / two internal compact flash slots / Full Light Path Diagnostic panel / customer serviceable / hot swap / front access / shared by all blade servers / requests for USB ports by pressing media select button on server blade front panel | | | | | | | | | |
| Keyboard / mouse | None standard / USB / provides KVM console support / requests for keyboard, mouse and video by pressing the display button on server blade front panel | | | | | | | | | |
| Ports | Rear: DB-15 telco alarm panel interface and one DB-50 blade serial aggregate for break out cable (both on alarm panel module); Front: two or four USB 2.0 (Media Tray) | | | | | | | | | |
| Security | Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures | | | | | | | | | |
| Ethernet | Each of the dual integrated gigabit ethernet controllers on each blade connects to an optional <i>GB Ethernet Switch Module</i> | | | | | | | | | |
| Systems mgmt | Provides remote console and mgmt / power on/off/reset blades/modules / monitors power status, operating system, temperature, disks, fans, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager | | | | | | | | | |
| System LED panel | System LED panel provides power-on, location, Critical, Major and Minor telecom alarm indicators, front and rear of chassis | | | | | | | | | |



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

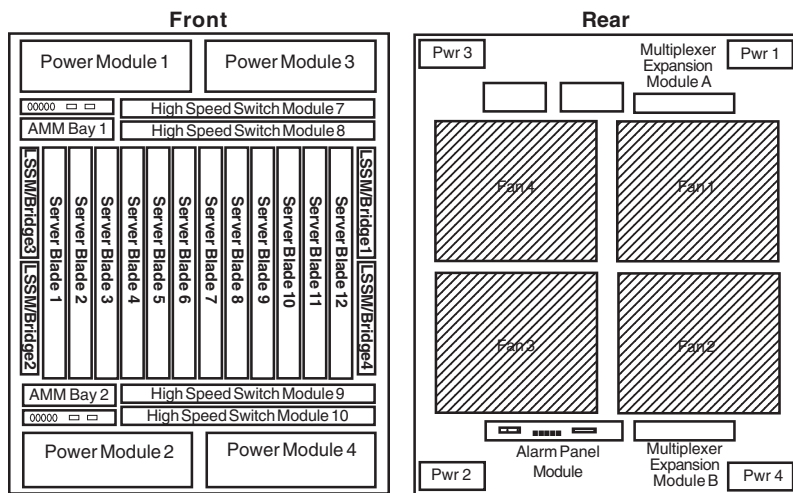
LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9209)
 - Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty

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

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

| IBM® Type-model | Supported Blades | Blade Servers std / max | Switch modules std / max | Switch modules (type) | Advanced Management modules std / max | Power modules std / max | Power module Wattage | Fan modules std / max | Mechanical | Available date |
|-----------------------------|--|-------------------------|--------------------------|---|---------------------------------------|-------------------------|----------------------|-----------------------|-----------------------|----------------|
| 8750-1RX | HS20/HS21/JS20/JS21/LS20/LS21/LS41/AMC/NGW | 0 / 12 | 0 / 8 | Enet, 10Gb Enet, Fibre Ch, IB, 4X IB, OPM and CPM | 1 / 2 | 2 / 4 | 3160W (AC 240V) | 4 / 4 | 12U ⁴ rack | Jun 2007 |
| Positioning Description | Leadership High Speed, High Performance, carrier grade blade platform for Next Generation Network applications Provides common resources shared by blade servers such as power, system management, cabling, ethernet management and expansion, external storage switching and connectivity, and I/O (USB and video) | | | | | | | | | |
| Blade bays | Supports all blades and Blade Expansion Units / 12 hot-swappable bays / front access | | | | | | | | | |
| High Speed Switch Modules | Std: none; max: four/ hot-swap / front access / 10Gb Ethernet / 4X InfiniBand / Copper 4X Pass-thru | | | | | | | | | |
| Legacy SwitchModules | Std: none; max: four/ hot-swap / front access / Gb Eth / 10Gb Eth uplink / 4Gb Fibre Channel / 4X InfiniBand uplink / Optical Pass-thru / Copper Pass-thru / | | | | | | | | | |
| Advanced Management Modules | Std: one; max: two / hot-swap / front access / comprehensive system management functions / PowerPC®440GP controller / communicates with integrated system management processor on each server blade / complete KVM switch local functionality / ports: DB-15 analog video port, Dual USB 2.0, Serial(RJ45), 10/100 ethernet remote management connection port | | | | | | | | | |
| Power Modules | Std: two; max: five / hot-swap / front access / input voltage range -48VDC to -60VDC (Min/Max) at 50/60Hz / redundant within pair (N+N redundancy) / power modules 1 and 2 support blade bays 1- 6, all legacy switch and bridge modules, upper and lower media trays, both advanced management modules, multiplexer expansion modules and alarm panel module / power modules 3 and 4 support blade bays 7-12 and all High Speed Switch Modules / worldwide / voltage-sensing / auto-restart / 3 fans per power module | | | | | | | | | |
| Fan Modules | Std/max: four / hot-swap / redundant / speed controlled according to ambient air temperature / rear access / front to back airflow | | | | | | | | | |
| Mechanical | EIA 19" rack models (12U⁴) x 706mm deep / supported in NetBAY™ Racks with seismic bracing | | | | | | | | | |
| Media Tray | Std: one; max: two / two USB 2.0 ports / two internal compact flash slots / Full Light Path Diagnostic panel / customer serviceable / hot swap / front access / shared by all blade servers / requests for USB ports by pressing media select button on server blade front panel | | | | | | | | | |
| Keyboard / mouse | None standard / USB / provides KVM console support / requests for keyboard, mouse and video by pressing the display button on server blade front panel | | | | | | | | | |
| Ports | Rear: DB-15 telco alarm panel interface and one DB-50 blade serial aggregate for break out cable (both on alarm panel module); Front: two or four USB 2.0 (Media Tray) | | | | | | | | | |
| Security | Login password for remote connection / secure socket layer (SSL) security for remote management access / recommended in rack environment providing security through lockable doors or other security measures | | | | | | | | | |
| Ethernet | Each of the dual integrated gigabit ethernet controllers on each blade connects to an optional <i>GB Ethernet Switch Module</i> | | | | | | | | | |
| Systems mgmt | Provides remote console and mgmt / power on/off/reset blades/modules / monitors power status, operating system, temperature, disks, fans, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager | | | | | | | | | |
| System LED panel | System LED panel provides power-on, location, Critical, Major and Minor telecom alarm indicators, front and rear of chassis | | | | | | | | | |



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

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
 - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9209)
- Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty

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

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

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

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

Server blade (top view)

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

- ❖ Stealth black front bezel
- ❖ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- ❖ 12 lbs; 5.4kg (max configuration)
- ❖ Configuration/Setup Utility: F1 at startup
- ❖ System Partition Boot: ALT+F1 at startup
- ❖ Network Boot: F12 at startup
- ❖ PXE Boot Agent Utility: Ctrl+S at startup
- ❖ Blade control panel on each HC10 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, power and power state indication
- ❖ **Preinstalled¹⁷ OS: Windows® Vista Business Blade PC Edition**
- ❖ **Supported¹⁷ OS: Windows XP Professional 64-bit Edition**

| | |
|---|---------|
| 1GB (2x512) PC2-5300 CL5 DDR2 667MHz Kit | 41Y2822 |
| 2GB (2x1GB) PC2-5300 CL5 DDR2 667MHz Kit | 41Y2825 |
| 4GB (2x2GB) PC2-5300 CL5 DDR2 667MHz Kit | 41Y2828 |
| IBM CP20 Workstation Connection Device | 3096CDX |
| Other options at ibm.com/products/us | |

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

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

LIMITED WARRANTY³

- ❖ 1 year parts and labor
- ❖ International Warranty Service³
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 44T6086)
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 44T6087)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 44T6088)
 - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 44T6089)
- ❖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ❖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

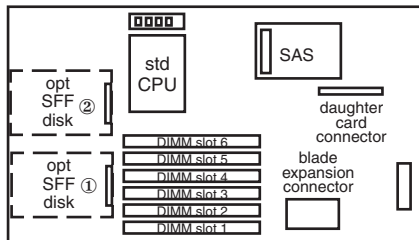
See footnotes for important warranty information

| IBM® Type-model | Processor | GHz¹ / Core / L2 | FSB MHz | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|---|---|------------------|---------|-------|--------|-----------------|------------|-----------------|-----------|-------------------|----------|----------------|
| 8014-1Ax | 1 x Celeron® 445 | 1.86/SC/512KB | 1066 | 65W | 512MB | SATA | 2-fixed | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8014-2Bx | 1 x Core™ 2 Duo E6305 | 1.86/DC/2MB | 1066 | 65W | 2GB | SATA | 2-fixed | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8014-EBx | 1 x Core 2 Duo E6305 | 1.86/DC/2MB | 1066 | 65W | 4GB | SATA | 2-fixed | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8028-23x | 1 x Xeon™ E6405 | 2.13/DC/2MB | 1066 | 65W | 2GB | SAS | 2-hot-swap | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8028-44x | 1 x Xeon X3323 | 2.5/QC/6MB | 1333 | 80W | 2GB | SAS | 2-hot-swap | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8028-45x | 1 x Xeon X3353 | 2.66/QC/12MB | 1066 | 80W | 2GB | SAS | 2-hot-swap | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8028-46x | 1 x Xeon X3363 | 2.83/QC/12MB | 1066 | 80W | 2GB | SAS | 2-hot-swap | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8028-E3x | 1 x Xeon E6405 | 2.13/DC/2MB | 1066 | 65W | 4GB | SAS | 2-hot-swap | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | May 2008 |
| 8028-4Lx | 1 x Xeon L5420 | 2.5/QC/12MB | 1333 | 50W | 2GB | SAS | 2-hot-swap | BSE3/PEU3e | up to 2 | single slot blade | Dual Gb | Sep 2008 |
| Processor(s) | Intel® Xeon up to 2.83GHz with up to 1333MHz FSB / up to 12MB L2 / Quad or Dual-Core / Intel Core 2 Duo at 1.86GHz with 1066MHz FSB / 2MB L2 / Dual-Core / Intel Celeron at 1.86GHz with 1066MHz FSB / 512KB / Single-Core / All EM64T | | | | | | | | | | | |
| Implementation | Systemboard contains one Intel LGA771 socket, six DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics, dual Gigabit ethernet and SATA or SAS | | | | | | | | | | | |
| Memory | 512MB or 2GB std / 24GB¹³ max / one or two slots used / four or five slots available / on base blade / PC2-5300 667MHz 240-pin ECC DDR2-SDRAM VLP (Very Low-Profile) DIMMs / DIMMs must be installed in matched pairs for optimal performance / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ and memory scrubbing | | | | | | | | | | | |
| SAS disk controller | LSI Logic® 1064E SAS controller / two port / 3.0Gb/sec / on interface card / PCI-Express / supports RAID-0 & 1 | | | | | | | | | | | |
| SAS Disk bays | Two 2.5-inch Small Form Factor (SFF) hot-swap SAS or hot-swap Solid State Drives / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit | | | | | | | | | | | |
| SATA disk controller | Integrated into chipset / 3.0 Gb/sec / two port | | | | | | | | | | | |
| SATA Disk bays | Two 2.5-inch Small Form Factor (SFF) SATA internal fixed disk bays / supports HDD and SSD (fixed in 8014, hot-swap in 8028) | | | | | | | | | | | |
| External Storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | |
| Mechanical | Single-wide(30mm) / full-height / Supported in IBM BladeCenter | | | | | | | | | | | |
| Architecture/Chipset | Intel 5100 chipset / Memory Controller Hub and ICH9 / I/O Controller Hub provides: High Speed Daughter Card connector, BSE connector and LSI 1064E SAS / ICH9 provides: USB (2.0), ATI video, SATA, Legacy Daughter Card connector, Dual GB ethernet, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | |
| BUS slots | Standard PCI Express HBA slots via PEU3e Expansion Unit | | | | | | | | | | | |
| Ethernet | Dual Gigabit Ethernet controller / Broadcom® 5714S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 Boot agent / 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 Kymb / video / mouse | None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel | | | | | | | | | | | |
| Graphics controller | None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel | | | | | | | | | | | |
| 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 diagnostics via ROM based preboot DSA | | | | | | | | | | | |
| Security | No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | |
| Software ship group | Documentation CD, ServerGuide CD | | | | | | | | | | | |
| Cooling Fans | Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel | | | | | | | | | | | |
| Power supply(s) | Uses power module(s) in BladeCenter | | | | | | | | | | | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter, operating system | | | | | | | | | | | |

| | |
|--|---------|
| IBM 73GB 10K SAS 2.5" SFF Slim-HS HDD | 43W7535 |
| IBM 80GB 7200RPM SATA 2.5" NHS HDD | 43W7640 |
| IBM 15.8GB 2.5" Solid State Drive | 43W7614 |
| IBM 31.4GB 2.5" Solid State Drive | 43W7618 |
| IBM 31.4GB SATA 2.5" SFF Slim-HS SSD | 43W7648 |
| 1GB (2x512) PC2-5300 CL5 ECC DDR2 RDIMM 667MHz Kit | 39M5861 |
| 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 RDIMM 667MHz Kit | 39M5864 |
| 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 RDIMM 667MHz Kit | 46C0512 |

Other options at ibm.com/products/us

Server blade (side view)



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

- ⊖ Stealth black front bezel
- ⊖ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- ⊖ 12 lbs; 5.4kg (max configuration)
- ⊖ Configuration/Setup Utility: F1 at startup
- ⊖ Diagnostics: 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 HS12 blade server provides media select button, keyboard/mouse/video indicators for blade error, information, location, disk activity, and power
- ⊖ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

LIMITED WARRANTY³

- ⊖ 8014 MT - 1 year parts and labor
- ⊖ 8028 MT - 3 year parts and labor
- ⊖ International Warranty Service³
- ⊖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⊖ 8028 MT On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 46V4568)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 46V4569)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 46V4570)
 - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 46V4571)
- ⊖ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊖ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

Maximum internal disk capacity for each HS12 blade server¹³:
 292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

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

| | | | | | | | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Processor(s) | 1 x Intel® Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 3.0GHz with 1333MHz FSB / 4MB L2 ECC Cache / Dual-Core / 1 x Intel Xeon up to 2.33GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T / NTX and H1x feature Low Voltage processors for reduced heat and power consumption, allowing even greater performance per watt | | | | | | | | | | | | | |
| SMP - L2 Cache Implementation | 2-way SMP / up to two Xeon Processors (same speed/cache size) / 4 or 8MB std and max / at processor speed Systemboard contains two Intel LGA771 sockets, four DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet | | | | | | | | | | | | | |
| Memory | 1 or 2GB std / 16GB ¹³ max / two slots used / two slots available / on base blade / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two wire faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / memory sparing / Additional memory DIMMs can be added to each base HS21 with the Memory and I/O Expansion Unit, allowing up to 32GB of memory per blade | | | | | | | | | | | | | |
| SAS disk controller | LSI Logic® 1064E SAS controller / two port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 & 1 mirroring / two 29-pin SFF SAS cables | | | | | | | | | | | | | |
| SAS Disk bays | Two 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit | | | | | | | | | | | | | |
| External Storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | | | |
| Mechanical Architecture/Chipset | Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 (L6x only supported in 8852) Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | | | |
| BUS slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | | | |
| Ethernet | Dual gigabit 10/100/1000 ethernet controller / Broadcom® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM) | | | | | | | | | | | | | |
| Network Interface | One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | | | |
| DVD / diskette / USB Kybd / video / mouse Graphics controller | None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | | | |
| Systems Mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) | | | | | | | | | | | | | |
| Security | No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | | | |
| Software ship group | Documentation CD, Broadcom CD, ServerGuide CD | | | | | | | | | | | | | |
| Cooling Fans | Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel | | | | | | | | | | | | | |
| Power supply(s) Prerequisites | Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system | | | | | | | | | | | | | |

Server blade (side view)

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

- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

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

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

LIMITED WARRANTY³

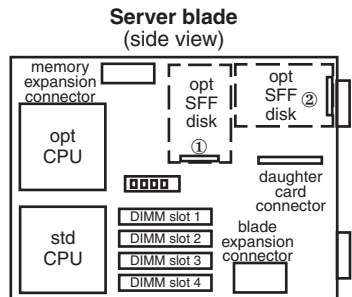
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response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

See footnotes for important warranty information

| IBM® Type-model | Processor | GHz¹ | L2 Core | FSB cache | Disk Watts | Disk Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date | |
|-----------------|-----------------|------|---------|-----------|------------|-------------|-----------------|-----------|-----------------|----------------|------------|-------------------|----------------|----------|
| 8853-J1x | 1 x Xeon™ L5310 | 1.6 | QC | 8MB | 1066 | 50W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Apr 2007 |
| 8853-J2x | 1 x Xeon L5320 | 1.86 | QC | 8MB | 1066 | 50W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Apr 2007 |
| 8853-C3x | 1 x Xeon X5355 | 2.66 | QC | 8MB | 1333 | 120W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Apr 2007 |
| 8853-C4x | 1 x Xeon X5365 | 3.0 | QC | 8MB | 1333 | 120W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Sep 2007 |
| 8853-G1x | 1 x Xeon E5405 | 2.0 | QC | 12MB | 1333 | 80W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 8853-G3x | 1 x Xeon E5420 | 2.5 | QC | 12MB | 1333 | 80W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 8853-G4x | 1 x Xeon E5430 | 2.66 | QC | 12MB | 1333 | 80W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 8853-G5x | 1 x Xeon E5440 | 2.83 | QC | 12MB | 1333 | 80W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 8853-G6x | 1 x Xeon E5450 | 3.0 | QC | 12MB | 1333 | 80W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 8853-G7x | 1 x Xeon X5460 | 3.16 | QC | 12MB | 1333 | 120W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Jan 2008 |
| 8853-EHx | 2 x Xeon E5450 | 3.0 | QC | 12MB | 1333 | 80W | 4GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 8853-R2x | 1 x Xeon X5260 | 3.33 | DC | 6MB | 1333 | 80W | 2GB | SAS | 2-fixed | MIO/SIO/PCIE/U | up to 2 | single slot blade | 2 x GB | Feb 2008 |

| | | | | | | | | | | | | | |
|----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Processor(s) | Intel® Xeon up to 3.33GHz with 1333MHz FSB / 6MB L2 / Dual-Core / Intel Xeon up to 1.86GHz with 1066MHz FSB / 8MB L2 ECC Cache / Quad-Core / Intel Xeon up to 3.16GHz with 1333MHz FSB / 12MB L2 ECC Cache / Quad-Core / All EM64T / J1x and J2x feature Low Voltage processors for reduced heat and power consumption, allowing greater performance per watt | | | | | | | | | | | | |
| SMP - L2 Cache Implementation | 2-way SMP / up to two Xeon Processors (same speed/cache size) / 6, 8 or 12MB std and max / ecc / at processor speed | | | | | | | | | | | | |
| Memory | 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 | | | | | | | | | | | | |
| 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/Chipsset | Single slot blade / Supported in IBM BladeCenter (C3x & C4x supported in 8852, G7x supported in 8852, 8740, 8750 & 8886) Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2 (ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | | |
| BUS slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | | |
| Ethernet | Dual gigabit ethernet controller / Broadcom® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM) | | | | | | | | | | | | |
| Network Interface | One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | | |
| DVD / diskette / USB | None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel | | | | | | | | | | | | |
| Kybd / video / mouse | None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel | | | | | | | | | | | | |
| Graphics controller | SVGA / ATI® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | | |
| Systems Mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | | |
| 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 / thermal sensors on each processor, BladeCenter modules and front panel | | | | | | | | | | | | |
| Power supply(s) | Uses power module(s) in BladeCenter | | | | | | | | | | | | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter, operating system | | | | | | | | | | | | |

| | | | |
|---|-----------------------------|-------------------------|---------|
| Xeon L5310 | 1.6GHz/1066/8MB L2 Cache | EM64T Proc Upg | 43W1145 |
| Xeon L5320 | 1.86GHz/1066/8MB L2 Cache | EM64T Proc Upg | 43W6084 |
| Xeon X5355 | 2.66 GHz/1333/8MB L2 Cache | EM64T Proc Upg | 43W6088 |
| Xeon X5365 | 3.0 GHz/1333/8MB L2 Cache | EM64T Proc Upg | 43W6133 |
| Xeon E5405 | 2.0 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 44T1716 |
| Xeon E5420 | 2.5 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 44T1742 |
| Xeon E5430 | 2.66 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 44T1724 |
| Xeon E5440 | 2.83 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 44T1740 |
| Xeon E5450 | 3.0 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 44T1728 |
| Xeon X5460 | 3.16 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 44T1738 |
| Xeon X5260 | 3.33 GHz/1333/6MB L2 Cache | EM64T Proc Upg | 44T1792 |
| 1GB (2x512) | PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | 39M5782 |
| 2GB (2x1GB) | PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | 39M5785 |
| 4GB (2x2GB) | PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | 39M5791 |
| 8GB (2x4GB) | PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | 39M5797 |
| BladeCenter Storage and I/O Expansion Blade | | | 39R7563 |
| BladeCenter Memory and I/O Expansion Blade | | | 42C1600 |
| BladeCenter SFF Fibre Channel Expansion Card | | | 26K4841 |
| QLogic iSCSI Expansion Card for BladeCenter | | | 32R1923 |
| Other options at ibm.com/products/us | | | |



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

- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6";
H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

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

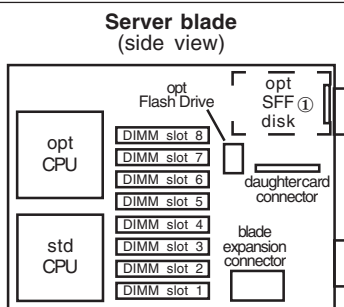
Maximum internal disk capacity for each HS21 blade server¹³:
 292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):⁷
 - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
 - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9523)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁹

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

| | | | | | | | | | | | | | |
|---------------------------------|--|--|--|--|--|--|--|--|--|--|---|---------|--|
| Processor(s) | 1 x Intel® Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 3.0GHz with 1333MHz FSB / 4MB L2 ECC Cache / Dual-Core / 1 x Intel Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 2.33GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T / NTx and H1x feature Low Voltage processors for reduced heat and power consumption | | | | | | | | | | | | |
| SMP - L2 Cache Implementation | 2-way SMP / up to two Xeon Processors (same speed/cache size) / 4 or 8MB L2 std and max / at processor speed Systemboard contains two Intel LGA771 sockets, eight DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet | | | | | | | | | | | | |
| Memory | 1 or 2GB std / 32GB ¹³ max / two slots used / six slots available / on base blade / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two bit faults on DIMMs, detects all permutations of two x4 DRAM failures, detects any two bits in error within 8 bytes of data, corrects any single bit error within 8 bytes of data) / memory sparing | | | | | | | | | | | | |
| SAS disk controller | LSI Logic® 1064E SAS controller / two port / 300MB/sec / on planar / 64-bit PCI-Express / one 29-pin SFF SAS cable | | | | | | | | | | | | |
| SAS Disk bays | One 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit / supports RAID 0, 1 and 5 | | | | | | | | | | | | |
| Flash Storage | Dedicated USB-based slot on system planar for optional USB 2.0 flash memory card (IBM 4GB Modular Flash Drive) | | | | | | | | | | | | |
| External Storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | | |
| Mechanical Architecture/Chipset | Single slot blade / Supported in IBM BladeCenter Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | | |
| BUS slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | | |
| Ethernet | Dual gigabit ethernet controller / Broadcom® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM) | | | | | | | | | | | | |
| Network Interface | One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | | |
| DVD / diskette / USB | None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel | | | | | | | | | | | | |
| Kybd / video / mouse | None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel | | | | | | | | | | | | |
| Graphics controller | SVGA / ATI® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | | |
| Systems Mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | Xeon5110 1.6GHz/1066/4MBL2CacheEM64TProcUpg | 42C0562 | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) | | | | | | | | | | Xeon5120 1.86GHz/1066/4MBL2CacheEM64TProcUpg | 40C0563 | |
| | | | | | | | | | | | Xeon5130 2.0GHz/1333/4MBL2CacheEM64TProcUpg | 40C0564 | |
| Security | No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | Xeon5140 2.33GHz/1333/4MBL2CacheEM64TProcUpg | 40C0565 | |
| | | | | | | | | | | | Xeon5150 2.66GHz/1333/4MBL2CacheEM64TProcUpg | 40C0566 | |
| Software ship group | Documentation CD, Broadcom CD, ServerGuide CD Uses cooling from BladeCenter chassis / thermal sensors on each processor and BladeCenter modules and front panel | | | | | | | | | | Xeon5160 3.0GHz/1333/4MBL2CacheEM64TProcUpg | 40C0567 | |
| | | | | | | | | | | | Xeon E5310 1.6GHz/1066/8MBL2CacheEM64TProcUpg | 43X1002 | |
| Cooling Fans | Uses power module(s) in BladeCenter chassis Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | Xeon E5320 1.86GHz/1066/8MBL2CacheEM64TProcUpg | 42C0572 | |
| | | | | | | | | | | | Xeon5138 2.13GHz/1333/4MBL2CacheEM64TProcUpg | 40C0568 | |
| Power supply(s) | Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | Xeon5148 2.33GHz/1333/4MBL2CacheEM64TProcUpg | 40C0569 | |
| | | | | | | | | | | | Xeon E5335 2.0GHz/1333/8MBL2CacheEM64TProcUpg | 43X1003 | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | Xeon E5345 2.33GHz/1333/8MBL2CacheEM64TProcUpg | 42C0570 | |
| | | | | | | | | | | | 1GB (2x512) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit | 39M5782 | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit | 39M5785 | |
| | | | | | | | | | | | 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit | 39M5791 | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit | 39M5797 | |
| | | | | | | | | | | | BladeCenter Storage and I/O Expansion Blade | 39R7563 | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | BladeCenter SFF Fibre Channel Expansion Card | 26K4841 | |
| | | | | | | | | | | | QLogic iSCSI Expansion Card for BladeCenter | 32R1923 | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | IBM 4GB Modular Flash Device | 39R8697 | |
| | | | | | | | | | | | Other options at ibm.com/products/us/ | | |



- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each HS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

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

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

LIMITED WARRANTY³

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

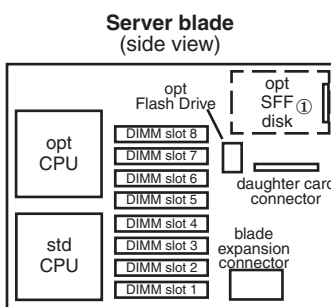
See footnotes for important warranty information

| IBM® Type-model | Processor | GHz ¹ | L2 Core | FSB cache | MHz | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|-----------------|------------------|---------|-----------|------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|----------|----------------|
| 7995-J1x | 1 x Xeon™ L5310 | 1.6 | QC | 8MB | 1333 | 50W | 2GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Sep 2007 |
| 7995-J2x | 1 x Xeon L5320 | 1.86 | QC | 8MB | 1333 | 50W | 2GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Sep 2007 |
| 7995-J3x | 1 x Xeon L5335 | 2.0 | QC | 8MB | 1333 | 50W | 2GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Sep 2007 |
| 7995-G1x | 1 x Xeon E5405 | 2.0 | QC | 12MB | 1333 | 80W | 1GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 7995-G3x | 1 x Xeon E5420 | 2.5 | QC | 12MB | 1333 | 80W | 1GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 7995-G4x | 1 x Xeon E5430 | 2.66 | QC | 12MB | 1333 | 80W | 1GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 7995-G5x | 1 x Xeon E5440 | 2.83 | QC | 12MB | 1333 | 80W | 1GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 7995-G6x | 1 x Xeon E5450 | 3.0 | QC | 12MB | 1333 | 80W | 1GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 7995-G7x | 1 x Xeon X5460 | 3.16 | QC | 12MB | 1333 | 120W | 2GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Jan 2008 |
| 7995-EHX | 2 x Xeon E5450 | 3.0 | QC | 12MB | 1333 | 80W | 4GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Dec 2007 |
| 7995-R2x | 1 x Xeon X5260 | 3.33 | DC | 6MB | 1333 | 80W | 1GB | SAS | 1-fixed | SIO | up to 2 | single slot blade | 2 x GB | Feb 2008 |

| | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Processor(s) | Intel® Xeon up to 3.33GHz with 1333MHz FSB / 8MB L2 / Dual-Core / Intel Xeon up to 2.0GHz with 1333MHz FSB / 8MB L2 / Quad-Core / Intel Xeon up to 3.16GHz with 1333MHz FSB / 12MB L2 / Quad-Core / All EM64T | | | | | | | | | | | | | |
| SMP - L2 Cache Implementation | 2-way SMP / up to two Xeon Processors (same speed/cache size) / 6, 8 or 12MB std and max / ecc / at processor speed Systemboard contains two Intel LGA771 sockets, four DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet | | | | | | | | | | | | | |
| Memory | 1, 2 or 4GB std / 32GB ¹³ max / two slots used / six slots available / on base blade / PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / ECC (corrects any x4 or x8 SDRAM device failure, detects all two 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 / one 29-pin SFF SAS cable | | | | | | | | | | | | | |
| SAS Disk bays | One 2.5-inch Small Form Factor (SFF) SAS internal fixed disk bays / Supports max of three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit | | | | | | | | | | | | | |
| Flash Storage External Storage | Dedicated USB-based slot on system planar for optional USB 2.0 flash memory card (IBM 4 or 8GB Modular Flash Drive) Support for IBM TotalStorage™ solutions | | | | | | | | | | | | | |
| Mechanical Architecture/Chipset | Single slot blade / Supported in IBM BladeCenter (G7x supported in 8852, 8740, 8750 & 8886) Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides PCI-Express bridge to Enterprise South Bridge 2(ESB2M), High Speed Daughter Card connector and BSE connector / ESB2M provides: USB (2.0), ATI video, Legacy Daughter Card connector, Dual GB ethernet, LSI 1064E SAS, LPC bus to NS PC87427 for Super I/O | | | | | | | | | | | | | |
| BUS slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | | | |
| Ethernet | Dual gigabit ethernet controller / Broadcom® 5708S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM) | | | | | | | | | | | | | |
| Network Interface | One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | | | |
| DVD / diskette / USB Kybd / video / mouse Graphics controller | None / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® ES1000 (RN50) on Planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | | | |
| Systems Mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) | | | | | | | | | | | | | |
| Security | No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | | | |
| Software ship group | Documentation CD, Broadcom CD, ServerGuide CD | | | | | | | | | | | | | |
| Cooling Fans | Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel | | | | | | | | | | | | | |
| Power supply(s) Prerequisites | Uses power module(s) in BladeCenter Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter, operating system | | | | | | | | | | | | | |

| | | | |
|--|-----------------------------|----------------|---------|
| Xeon L5310 | 1.6GHz/1333/8MB L2 Cache | EM64T Proc Upg | 42C0571 |
| Xeon L5320 | 1.86GHz/1333/8MB L2 Cache | EM64T Proc Upg | 43W3917 |
| Xeon L5335 | 2.0GHz/1333/8MB L2 Cache | EM64T Proc Upg | 43W3944 |
| Xeon E5405 | 2.0 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 43W3991 |
| Xeon E5420 | 2.5 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 43W3993 |
| Xeon E5430 | 2.66 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 43W3994 |
| Xeon E5440 | 2.83 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 43W3995 |
| Xeon E5450 | 3.0 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 43W3996 |
| Xeon X5460 | 3.16 GHz/1333/12MB L2 Cache | EM64T Proc Upg | 43W3997 |
| Xeon X5260 | 3.33 GHz/1333/6MB L2 Cache | EM64T Proc Upg | 43W4036 |
| 1GB (2x512) PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | | 39M5782 |
| 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | | 39M5785 |
| 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | | 39M5791 |
| 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 | Chipkill FBD 667MHz Kit | | 39M5797 |
| BladeCenter Storage and I/O Expansion Blade | | | 39R7563 |
| BladeCenter Memory and I/O Expansion Blade | | | 42C1600 |
| BladeCenter SFF Fibre Channel Expansion Card | | | 26K4841 |
| QLogic iSCSI Expansion Card for BladeCenter | | | 32R1923 |
| IBM 4GB Modular Flash Drive | | | 39R8697 |
| IBM 8GB Modular Flash Drive | | | 43W3934 |

Other options at ibm.com/products/us



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

- ◇ Stealth black front bezel
- ◇ H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- ◇ 12 lbs; 5.4kg (max configuration)
- ◇ Configuration/Setup Utility: F1 at startup
- ◇ Diagnostics (PC-Doctor™): F2 at startup
- ◇ System Partition Boot: ALT+F1 at startup
- ◇ Network Boot: F12 at startup
- ◇ PXE Boot Agent Utility: Ctrl+S at startup
- ◇ Blade control panel on each HS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- ◇ Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

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

Maximum internal disk capacity for each HS21 XM blade server^{a3}:
 146GB with one SAS disk (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 438GB)

LIMITED WARRANTY³

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

| IBM® Type-model | Processor | GHz¹ | Core | L3 cache | Watts | Memory | Disk controller | Disk bays | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|-----------------|------|------|----------|-------|--------|-----------------|------------|-----------|-------------------|----------|----------------|
| 7870-D2x | 1 x Xeon® E5502 | 1.86 | 2C | 4MB | 80W | 2x1GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-A2x | 1 x Xeon E5504 | 2.0 | 4C | 4MB | 80W | 2x1GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-CCx | 1 x Xeon E5504 | 2.0 | 4C | 4MB | 80W | 2x1GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-B3x | 1 x Xeon E5530 | 2.4 | 4C | 8MB | 80W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-B4x | 1 x Xeon E5540 | 2.53 | 4C | 8MB | 80W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-C3x | 1 x Xeon X5560 | 2.8 | 4C | 8MB | 95W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-C4x | 1 x Xeon X5570 | 2.93 | 4C | 8MB | 95W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-L2x | 1 x Xeon L5520 | 2.26 | 4C | 8MB | 60W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |

Positioning Processor(s) *Two-socket, four-core high performance blade server for business and distributed enterprises*
Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 2.0GHz with 4MB L3 / 2 or 4 Core / Hyper-Threading
 L3 cache **4 or 8MB** std and max / at processor speed
 SMP **2-way SMP** / up to two Xeon Processors (same speed/cache size)

Implementation Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports

Memory **2 or 4GB std / 48GB max per processor(using 8GB DIMMs**)** / **PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs** / twelve slots on base blade / ChipKill / memory mirroring

Disk Controller **LSI Logic® 1064E SAS controller / four port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 & 1 / Two 2.5-inch Small Form Factor (SFF) hot swap disk bays / supports SAS, SATA or SSD SFF disks**
 Disk bays Dedicated USB-based slot on systemboard for optional Hypervisor USB key
 Flash Storage Support for IBM TotalStorage™ solutions
 External Storage

Mechanical Single slot blade / Supported in IBM BladeCenter E, S and H

Architecture/Chipset **Intel 5520 chipset** / Intel IO Hub provides PCI-Express bridge to: ICH10 South Bridge, High Speed Daughter Card connector and Legacy Daughter Card connector(CIOv), BCM5709S dual GbE, LSI 1064E SAS / ICH10 South Bridge provides: USB, PCI-Express and LPC bus to VSC452 for video and limited Super I/O
 BUS slots No PCI or PCI-X slots (expansion via modules or network-interface option connector)

Ethernet **Dual Gigabit Ethernet ports / Broadcom® 5709S / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / 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)

Optical / diskette / USB Kybd / video / mouse Graphics controller None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel
 None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel
 SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / 32-bit 33MHzPCI 2.2

Systems Mgmt **Integrated Management Module(IMM) / VSC452 / H8S2461 / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / RS-485 interface for intermanagement communication with BladeCenter Management module / remote supervision and cKVM standard**
 Diagnostics **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics

Security No security intrusion protection / Trusted Platform Module(TPM) / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Software ship group Documentation CD, Broadcom CD, ServerGuide CD

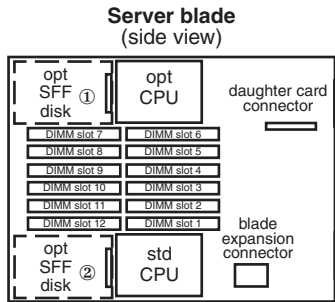
Cooling Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel

Power supply(s) Uses power module(s) in BladeCenter chassis

Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system

| | |
|--|---------|
| Xeon E5502 1.86GHz 80W 4.8GTs Proc Upg | 43W5986 |
| Xeon E5504 2.0GHz 80W 4.8GTs Proc Upg | 44T1712 |
| Xeon E5506 2.13GHz 80W 4.8GTs Proc Upg | 43W5987 |
| Xeon E5520 2.26GHz 80W 5.86GTs Proc Upg | 44T1736 |
| Xeon E5530 2.4GHz 80W 5.86GTs Proc Upg | 44T1883 |
| Xeon E5540 2.53GHz 80W 5.86GTs Proc Upg | 44T1884 |
| Xeon X5550 2.67GHz 95W 6.4GTs Proc Upg | 44T1885 |
| Xeon X5560 2.8GHz 95W 6.4GTs Proc Upg | 44T1886 |
| Xeon X5570 2.93GHz 95W 6.4GTs Proc Upg | 44T1887 |
| Xeon L5520 2.26GHz 60W 5.86GTs Proc Upg | 46M0697 |
| 1GB (1x1GB) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1485 |
| 2GB (1x2GB) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1487 |
| 4GB (1x4GB) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1488 |
| IBM 300GB 10K 6Gb SAS 2.5" SFF Slim-HS HDD | 42D0637 |
| IBM 31.4GB SSD 2.5" SFF Slim-HS HDD | 43W7648 |
| SAS Connectivity Card for IBM BladeCenter | 43W4068 |
| Ethernet Expansion Card for IBM BladeCenter | 44W4475 |

Other options at ibm.com/products/us



Bay ① 2.5", hot swap, front access, optional 2.5-inch SFF SAS disk
 Bay ② 2.5", hot swap, front access, optional 2.5-inch SFF SAS disk

A control panel on front of blade has the following LEDs:
 Power
 Activity
 Location
 Information
 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(preboot DSA): 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 HS22 blade server provides media select button, keyboard/mouse/video select button and indicators for blade error, information, location, disk activity and power
- Predictive Failure Analysis³ alerts on memory, processor(s), and disk(s) with IBM Director

LIMITED WARRANTY³

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

Maximum internal disk capacity for each HS22 blade server³: 600GB with two 300GB SAS disks

| IBM® Type-model | Processor | GHz ¹ | L3 Core cache | Watts | Memory | Disk controller | Disk bays | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|-----------|------------------|---------------|-------|--------|-----------------|------------|-----------|-------------------|----------|----------------|
| 7870-EDx* | 1 x Xeon® | E5502 1.86 | 2C 4MB | 80W | 3x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-EBx* | 2 x Xeon | E5530 2.4 | 4C 8MB | 80W | 4x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-1Mx* | 2 x Xeon | X5560 2.8 | 4C 8MB | 95W | 6x4GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-2Mx* | 2 x Xeon | L5520 2.26 | 4C 8MB | 60W | 12x4GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-3Mx* | 2 x Xeon | X5570 2.93 | 4C 8MB | 95W | 12x4GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-5Mx* | 2 x Xeon | X5560 2.8 | 4C 8MB | 95W | 6x4GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-6Mx* | 1 x Xeon | L5520 2.26 | 4C 8MB | 60W | 2x4GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7870-ECx* | 2 x Xeon | X5560 2.8 | 4C 8MB | 95W | 4x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | June 2009 |

Positioning Processor(s) *Two-socket, four-core high performance blade server for business and distributed enterprises*
Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading / up to 2.0GHz with 4MB L3 / 2 or 4 Core / Hyper-Threading
 L3 cache **4 or 8MB** std and max / at processor speed
 SMP **2-way SMP** / up to two Xeon Processors (same speed/cache size)

Implementation Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports

Memory **2 or 4GB std / 48GB max per processor(using 8GB DIMMs) / PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs** / twelve slots on base blade / ChipKill / memory mirroring

Disk Controller **LSI Logic® 1064E SAS controller / four port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 & 1 /**
 Disk bays **Two 2.5-inch Small Form Factor (SFF) hot swap disk bays / supports SAS, SATA or SSD SFF disks**
 Flash Storage **Dedicated USB-based slot on systemboard for optional Hypervisor USB key**
 External Storage **Support for IBM TotalStorage™ solutions**

Mechanical Single slot blade / Supported in IBM BladeCenter E, S and H

Architecture/Chipset **Intel 5520 chipset / Intel IO Hub provides PCI-Express bridge to: ICH10 South Bridge, High Speed Daughter Card connector and Legacy Daughter Card connector(CIOv), BCM5709S dual GbE, LSI 1064E SAS / ICH10 South Bridge provides: USB, PCI-Express and LPC bus to VSC452 for video and limited Super I/O**
 BUS slots **No PCI or PCI-X slots (expansion via modules or network-interface option connector)**

Ethernet **Dual Gigabit Ethernet ports / Broadcom® 5709S / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / 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)**

Optical / diskette / USB Kybd / video / mouse Graphics controller **None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / 32-bit 33MHz PCI 2.2**

Systems Mgmt **Integrated Management Module(IMM) / VSC452 / H8S2461 / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / RS-485 interface for intermanagement communication with BladeCenter Management module / remote supervision and cKVM standard**
 Diagnostics **Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics**

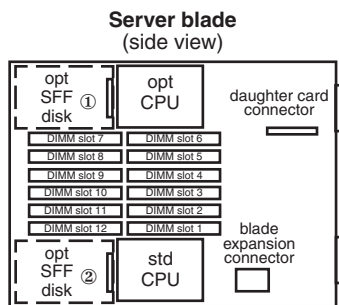
Security **No security intrusion protection / Trusted Platform Module(TPM) / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode**

Software ship group Documentation CD, Broadcom CD, ServerGuide CD

Cooling Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel

Power supply(s) Uses power module(s) in BladeCenter chassis

Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system



Bay ① 2.5", hot swap, front access, optional 2.5-inch SFF SAS disk
 Bay ② 2.5", hot swap, front access, optional 2.5-inch SFF SAS disk

A control panel on front of blade has the following LEDs:
 Power
 Activity
 Location
 Information
 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: 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 HS22 blade server provides media select button, keyboard/mouse/video select button and indicators for blade error, information,

Other options at ibm.com/products/us

LIMITED WARRANTY³

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

Maximum internal disk capacity for each HS22 blade server¹³: 600GB with two 300GB SAS disks

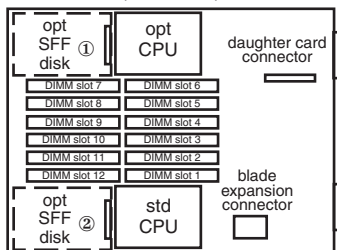
| IBM® Type-model | Processor | GHz ¹ | L3 Core cache | Watts | Memory | Disk controller | Disk bays | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|-----------------|------------------|---------------|-------|--------|-----------------|------------|-----------|-------------------|----------|----------------|
| 7870-L3x | 1 x Xeon® L5530 | 2.4 | 4C 8MB | 60W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Sep 2009 |
| 7870-M2x | 1 x Xeon L5518 | 2.13 | 4C 8MB | 60W | 2x2GB | SAS | 2 hot-swap | up to 2 | single slot blade | 2 x Gb | Sep 2009 |

| | | | | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) | <i>Two-socket, four-core high performance blade server for business and distributed enterprises</i> | | | | | | | | | | |
| L3 cache SMP | Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 2.4GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading 8MB std and max / at processor speed 2-way SMP / up to two Xeon Processors (same speed/cache size) | | | | | | | | | | |
| Implementation | Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports | | | | | | | | | | |
| Memory | 4GB std / 48GB max per processor(using 8GB DIMMs) / PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs / twelve slots on base blade / ChipKill / memory mirroring | | | | | | | | | | |
| Disk Controller | LSI Logic® 1064E SAS controller / four port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 & 1 / Two 2.5-inch Small Form Factor (SFF) hot swap disk bays / supports SAS, SATA or SSD SFF disks | | | | | | | | | | |
| Disk bays | Dedicated USB-based slot on systemboard for optional Hypervisor USB key | | | | | | | | | | |
| Flash Storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | |
| External Storage | | | | | | | | | | | |
| Mechanical | Single slot blade / Supported in IBM BladeCenter E, S and H | | | | | | | | | | |
| Architecture/Chipset | Intel 5520 chipset / Intel IO Hub provides PCI-Express bridge to: ICH10 South Bridge, High Speed Daughter Card connector and Legacy Daughter Card connector(CIOv), BCM5709S dual GbE, LSI 1064E SAS / ICH10 South Bridge provides: USB, PCI-Express and LPC bus to VSC452 for video and limited Super I/O | | | | | | | | | | |
| BUS slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | |
| Ethernet | Dual Gigabit Ethernet ports / Broadcom® 5709S / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / TCP/IP Offload Engine (TOE) / Wake on LAN® / iSCSI / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Passthrough Module</i> (the second controller requires a second optional switch or PM) | | | | | | | | | | |
| Network Interface | One 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) | | | | | | | | | | |
| Optical / diskette / USB Kybd / video / mouse Graphics controller | None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / 32-bit 33MHzPCI 2.2 | | | | | | | | | | |
| Systems Mgmt | Integrated Management Module(IMM) / VSC452 / H8S2461 / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / RS-485 interface for intermanagement communication with BladeCenter Management module / remote supervision and cKVM standard | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics | | | | | | | | | | |
| Security | No security intrusion protection / Trusted Platform Module(TPM) / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | |
| Software ship group | Documentation CD, Broadcom CD, ServerGuide CD | | | | | | | | | | |
| Cooling | Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel | | | | | | | | | | |
| Power supply(s) | Uses power module(s) in BladeCenter chassis | | | | | | | | | | |
| Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system | | | | | | | | | | |

| | |
|---|---------|
| Xeon L5506 2.13GHz 4MB L3 Proc Upg | 43W5986 |
| Xeon L5508 2.0GHz 8MB L3 Proc Upg | 44T1712 |
| Xeon L5518 2.13GHz 8MB L3 Proc Upg | 43W5987 |
| Xeon L5530 2.4GHz 8MB L3 Proc Upg | 44T1736 |
| 1GB (1x1GB) SR PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1485 |
| 2GB (1x2GB) SR PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1487 |
| 2GB (1x2GB) DR PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1486 |
| 4GB (1x4GB) DR PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 44T1488 |
| 8GB (1x8GB) DR PC3-8500 CL7 ECC DDR3 1066MHz VLP RDIMM | 44T1579 |
| 8GB (1x8GB) DR PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM | 46C7451 |
| IBM 300GB 10K 6Gb SAS 2.5" SFF Slim-HS HDD | 42D0637 |
| IBM 31.4GB SSD 2.5" SFF Slim-HS HDD | 43W7648 |
| SAS Connectivity Card for IBM BladeCenter | 43W4068 |
| Ethernet Expansion Card for IBM BladeCenter | 44W4475 |

Other options at ibm.com/products/us

Server blade (side view)



- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics: 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 HS22 blade server provides media select button, keyboard/mouse/video select button and indicators for blade error, information,

Bay ① 2.5", hot swap, front access, optional 2.5-inch SFF SAS disk
 Bay ② 2.5", hot swap, front access, optional 2.5-inch SFF SAS disk

A control panel on front of blade has the following LEDs:
 Power
 Activity
 Location
 Information
 Fault

Maximum internal disk capacity for each HS22 blade server¹³:
 600GB with two 300GB SAS disks

LIMITED WARRANTY³

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

See footnotes for important warranty information

* Express Models

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

| | | | | | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|--|---|---------|
| Positioning | The IBM BladeCenter JS21 blade server delivers exceptional capabilities for AIX 5L™, HPC Linux Clusters, web serving, and server consolidation. With built-in virtualization, the JS21 is equally suitable for building front-end and mid-tier web farms with virtual Linux partitions, saving time and money on setup and deployment, or migrating older UNIX workloads to BladeCenter to reduce maintenance costs. The JS21 is also optimized for scientific research in life sciences and seismic analysis with its integrated vector accelerator. For the needs of SMB and HPC, the JS21 Express models (E3U, E5U) are available pre-configured with faster 533MHz memory and integrated storage for out-of-the-box functionality at a lower price. | | | | | | | | | | | |
| Processor(s) L2 Cache SMP support Implementation | 2 x IBM PowerPC™ 970MP up to 2.7GHz* Single-Core / up to 2.5GHz* Dual-Core / 64 bit 1MB L2 Cache per core 2-core or 4-core SMP / two PowerPC Processors (single core or dual core) Server blade contains two IBM PowerPC microprocessors soldered to planar, four DIMM slots, 17X PCI Express, SAS controller, Gigabit Ethernet, Fibre Channel, Myrinet and InfiniBand expansion card support, integrated graphics and dual Gigabit ethernet | | | | | | | | | | | |
| Memory | 1, 2 or 4GB std / 16GB ¹³ max / two slots used / two slots available / PC2-3200 400MHz CL3 ECC DDR2-SDRAM DIMMs or PC2-4200 533MHz CL4 ECC DDR2-SDRAM DIMMs / four DIMM gold-conductor slots / DIMMs must be installed in matched pairs [a bank] and banks must match in speed (MHz), though not size / 2-way memory interleave / dual-channel / Chipkill with x4 DIMMs | | | | | | | | | | | |
| SAS Disk controller SAS Disk bays External Storage | One integrated / IBM SAS controller / two port / on planar / 64-bit 133MHz PCI-X / supports RAID-0 & 1 Supports max of two non-hot-swap 2.5" / small form factor (SFF) SAS drives / 3.0GB/s / E3X and E5X include one 73GB drive std Support for IBM TotalStorage™ solutions (including FASiT and NAS family of products) | | | | | | | | | | | |
| Mechanical Architecture/Chipset | Single-wide Blade / Supported in IBM BladeCenter, IBM BladeCenter T** and IBM BladeCenter H IBM U4 Northbridge / BCM5780 PCI Express, PCI-X Bridge and HyperTransport Tunnel for PCIe and Dual Gigabit Ethernet / AMD 8111 Southbridge providing USB1.1 and Video / NS PC87427 Super I/O off LPC interface | | | | | | | | | | | |
| BUS slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | |
| Ethernet Controllers | Dual Gigabit 10/100/1000 ethernet controller / Broadcom® 5780 / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz / full duplex / Wake on LAN® / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Load balancing or teaming / one of the dual controllers connects to an optional, supported Ethernet switch or Optical Passthrough Module (the second controller requires a second optional switch or OPM) | | | | | | | | | | | |
| Network Interface | One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | |
| DVD / Diskette / USB Kybd / video / mouse Graphics controller | None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® RN50 on Planar / 32MB DDR SDRAM std and max / 15 pin connector | | | | | | | | | | | |
| Systems Mgmt | IBM Integrated Service Processor / H82166 / IPMI 1.5 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module / Cluster System Management / IBM Active Energy Manager™ / HMCMP | | | | | | | | | | 1GB (2x512MB) PC2-4200 ECC CL4 DDR2 RDIMM Kit | 41Y2707 |
| | | | | | | | | | | | 2GB (2x1GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit | 41Y2711 |
| | | | | | | | | | | | 4GB (2x2GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit | 41Y2715 |
| | | | | | | | | | | | 8GB (2x4GB) PC2-4200 ECC CL4 DDR2 RDIMM Kit | 41Y2703 |
| | | | | | | | | | | | 1GB (2x512MB) PC2-3200 ECC CL3 DDR2 RDIMM Kit | 39M5821 |
| | | | | | | | | | | | 2GB (2x1GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit | 39M5809 |
| | | | | | | | | | | | 4GB (2x2GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit | 39M5812 |
| | | | | | | | | | | | 8GB (2x4GB) PC2-3200 ECC CL3 DDR2 RDIMM Kit | 41Y2703 |
| | | | | | | | | | | | IBM 36GB 10K SAS 2.5" SFF NHD HDD | 26K5776 |
| | | | | | | | | | | | IBM 73GB 10K SAS 2.5" SFF NHD HDD | 26K5777 |
| | | | | | | | | | | | QLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter | 26R0890 |
| | | | | | | | | | | | BladeCenter SFF Gigabit Ethernet Expansion Card for BladeCenter | 39R8624 |
| | | | | | | | | | | | Cisco InfiniBand Expansion Card for BladeCenter | 32R1896 |
| | | | | | | | | | | | Myrinet Expansion Card for BladeCenter | 73P6000 |
| | | | | | | | | | | | Cisco 4X InfiniBand Switch Module for BladeCenter | 32R1756 |
| | | | | | | | | | | | Cisco 4X InfiniBand Expansion Card for BladeCenter | 32R1760 |
| | Other options at ibm.com/products/us | | | | | | | | | | | |

Server blade (side view)

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

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

- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- 31U/E3U 2-core 288W / 51U/E5U 4-core 308W
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each JS21 blade server provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
- Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

Maximum internal disk capacity for each JS21 blade server¹³:
146GB with two 73GB SCSI disks (with BladeCenter Storage Expansion Unit 3 x 73GB for total of 219GB***)

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

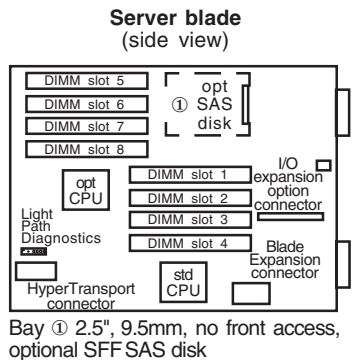
LIMITED WARRANTY³

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

| IBM® Type-model | Qty x Processor ¹ | Speed/Core | L2 Cache | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|------------------------------|------------|----------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|-------------|----------------|
| 7971-31U | 1 x Opteron 2212HE | 2.0GHz/DC | 2MB | 68W | 1GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7971-3AU | 1 x Opteron 2212 | 2.0GHz/DC | 2MB | 95W | 1GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7971-51U | 1 x Opteron 2216HE | 2.4GHz/DC | 2MB | 68W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7971-6AU | 1 x Opteron 2218 | 2.6GHz/DC | 2MB | 95W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7971-E1U | 2 x Opteron 2216HE | 2.4GHz/DC | 2MB | 95W | 4GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Dec 2006 |
| 7971-21U | 1 x Opteron 2210HE | 1.8GHz/DC | 2MB | 68W | 1GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Jan 2007 |
| 7971-2TU | 1 x Opteron 2210HE | 1.8GHz/DC | 2MB | 45W | 1GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Feb 2007 |
| 7971-7AU | 1 x Opteron 2220 | 2.8GHz/DC | 2MB | 95W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Feb 2007 |
| 7971-61U | 1 x Opteron 2218HE | 2.6GHz/DC | 2MB | 68W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Apr 2007 |
| 7971-8AU | 1 x Opteron 2222 | 3.0GHz/DC | 2MB | 95W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2007 |

| | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) L2 Cache SMP support Implementation | Ultra-dense, low power, dual socket, full performance modular computing platform with superior performance Up to 2 x AMD Opteron 2000 Series Dual Core at up to 3.0GHz / simultaneously supports 32-bit and 64-bit computing 1MB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O 2-way SMP / up to two Opteron processors (same speed/cache size) 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 SAS disk controller | None 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 External storage | 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 Support for IBM TotalStorage™ solutions | | | | | | | | | | | |
| Mechanical Architecture/Chipsets | Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 ServerWorks™ Chipset / HT2000 HyperTransport System I/O Controller provides: PCI-Express bridge to Legacy Daughter Card connector and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O | | | | | | | | | | | |
| Bus slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | |
| Ethernet controllers | Dual gigabit 10/100/1000 Ethernet controllers / Broadcom® BCM5706S / two full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-X 64-bit 133MHz bus / full-duplex / TCP/IP OffloadEngine (TOE) / Wake on LAN® / Serial over LAN / Alert Standard Format 1.0 / Load balancing or teaming / Failover, adapter fault tolerance / one of the dual controllers connects to an optional, supported Ethernet switch or <i>Passthrough Module</i> (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 Kybd / video / mouse Graphics | None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | |
| Systems mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) | | | | | | | | | | | |
| Security | Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | |
| Software ship group Cooling fans | Documentation CD, Device Driver CD, ServerGuide CD Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) | | | | | | | | | | | |
| Power supply Prerequisites | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system | | | | | | | | | | | |

| | |
|---|---------|
| Dual Core AMD Opteron Processor Model 2210 HE | 40K1263 |
| Dual Core AMD Opteron Processor Model 2212 HE | 25F8898 |
| Dual Core AMD Opteron Processor Model 2212 | 25F8931 |
| Dual Core AMD Opteron Processor Model 2216 HE | 25F8899 |
| Dual Core AMD Opteron Processor Model 2218 | 25F8897 |
| Dual Core AMD Opteron Processor Model 2218 HE | 44E5246 |
| Dual Core AMD Opteron Processor Model 2220 | 40K1264 |
| Dual Core AMD Opteron Processor Model 2222 | 44F4946 |
| 1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit | 39M5861 |
| 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit | 39M5864 |
| 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit | 39M5867 |
| 8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit* | 39M5870 |
| IBM 36GB NHS 2.5" SFF SAS HDD | 26K5776 |
| IBM 73GB NHS 2.5" SFF SAS HDD | 26K5777 |
| BladeCenter Storage and I/O Expansion Blade | 39F7563 |
| BladeCenter SFF Fibre Channel Expansion Card | 26K4841 |
| BladeCenter SFF Gigabit Ethernet Expansion Card | 39F8624 |
| 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
- Stealth black front bezel
 - H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
 - 11 lbs; 5.0kg (max configuration)
 - Configuration/Setup Utility: F1 at startup
 - Diagnostics (PC-Doctor™): F2 at startup
 - Network Boot: F12 at startup
 - PXE Boot Agent Utility: Ctrl+S at startup
 - Blade control panel on each LS21 blade provides media select button, keyboard/mouse/video select button, and indicators for blade error, information, location, disk activity, and power
 - Predictive Failure Analysis® alerts on memory, processor(s), and optional disk(s) with IBM Director

LIMITED WARRANTY³

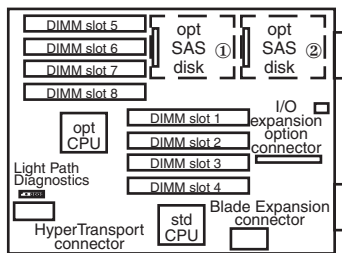
- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P5917)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P6918)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P5921)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P5922)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9525)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9526)
 - Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7¹⁴ toll-free support for warranty issues during the warranty period⁸

See footnotes for important warranty information

| 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 |
|-----------------|------------------------------|------------|----------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|----------|----------------|
| 7901-3Qx | 1 x Opteron 2347 HE | 1.9GHz/4C | 2MB | 79W | 2GB | SAS | 2 fixed | PCIEU/ PEU2 | up to 2 | single slot blade | 2 x Gb | Sep 2008 |
| 7901-CQx | 1 x Opteron 2356 | 2.3GHz/4C | 2MB | 115W | 2GB | SAS | 2 fixed | PCIEU/ PEU2 | up to 2 | single slot blade | 2 x Gb | Sep 2008 |
| 7901-EDx* | 2 x Opteron 2356 | 2.3GHz/4C | 2MB | 115W | 8GB | SAS | 2 fixed | PCIEU/ PEU2 | up to 2 | single slot blade | 2 x Gb | Sep 2008 |
| 7901-3Sx | 1 x Opteron 2384 | 2.7GHz/4C | 2MB | 75W | 2GB | SAS | 2 fixed | PCIEU/ PEU2 | up to 2 | single slot blade | 2 x Gb | Nov 2008 |
| 7901-3Lx | 1 x Opteron 2376 HE | 2.3GHz/4C | 2MB | 55W | 2GB | SAS | 2 fixed | PCIEU/ PEU2 | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7901-62x | 1 x Opteron 2435 | 2.6GHz/6C | 3MB | 75W | 2GB | SAS | 2 fixed | PCIEU/ PEU2 | up to 2 | single slot blade | 2 x Gb | July 2009 |

| | | | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) | Ultra-dense, dual-socket, up to six-core, modular computing platform with superior performance Up to 2 x AMD Opteron 2000 Series / Six-Core at 2.6GHz / Four-Core up to 2.7GHz / simultaneously supports 32-bit and 64-bit computing | | | | | | | | | | | |
| L2 Cache | 2MB or 3MB L2 Cache / AMD Direct Connect Architecture ensures lower latency I/O | | | | | | | | | | | |
| SMP support Implementation | 2-way SMP / up to two Opteron processors (same speed/cache size) Systemboard contains two LGA 1207-pin sockets, eight VLP DIMM slots, one Legacy Daughter Card connector, one Blade Expansion connector, one HyperTransport Expansion connector, integrated graphics, SAS and ethernet | | | | | | | | | | | |
| Memory | 2x1GB or 4x2GB std / 64GB max ¹³ / two or four slots used / four or six slots available / PC2-5300 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (std) / PC2-6400 800MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (opt) / 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 | | | | | | | | | | | |
| SAS disk controller SAS disk bays | LSI Logic®1064E SAS controller / 1.5/3.0 Gb/s / PCI-Express / on planar / supports RAID-1 / no cables or external connector Two fixed 2.5" SFF SAS disks | | | | | | | | | | | |
| External storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | |
| Mechanical Architecture/Chipsets | Single slot blade / Supported in IBM BladeCenter 8677**, 8852 and 8886 ServerWorks™ Chipset / HT2100 HyperTransport System I/O Controller provides: PCI-Express links to Blade Storage Expansion connector and PCI-Express Switch to SAS and Ethernet controllers, HyperTransport bridge to HT1000 South Bridge / HT 1000 South Bridge provides: Legacy Daughter Card connector via 64-bit PCI-X bus, USB, ATI video via 32-bit PCI bus, 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 Ethernet ports / Broadcom® BCM5709S Gigabit Ethernet controller / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full-duplex / TCP/IP Offload Engine (TOE) / PXE 2.0 / Wake on LAN® / iSCSI / Serial over LAN / failover, adapter fault tolerance / load balancing / connects to optional, supported Ethernet switches or <i>Passthrough Modules</i> (requires a second optional switch or PM for failover) | | | | | | | | | | | |
| Network-interface | One legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | |
| DVD / diskette / USB Kybd / video / mouse Graphics | None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | |
| Systems mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | Four Core AMD Opteron Processor Model 2347 HE 44X1542 Four Core AMD Opteron Processor Model 2356 44R4961 Four Core AMD Opteron Processor Model 2376 HE 46M6880 Four Core AMD Opteron Processor Model 2384 46M6808 Six Core AMD Opteron Processor Model 2435 49Y4747 | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via Preboot DSA) | | | | | | | | | | | |
| Security | Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | |
| Software ship group | Documentation CD, Device Driver CD, ServerGuide CD | | | | | | | | | | | |
| Cooling fans | Uses cooling from BladeCenter (types 8677**, 8852 and 8886) / thermal sensors on each processor and BladeCenter modules and front panel | | | | | | | | | | | |
| Power supply Prerequisites | Uses power modules in BladeCenter (types 8677**, 8852 and 8886) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677**, 8852 and 8886), operating system | | | | | | IBM 73GB NHS 2.5" 10K SFF SAS HDD 26K5777 IBM 146GB NHS 2.5" 10K SFF SAS HDD 42D0241 IBM 73GB NHS 2.5" 15K SFF SAS HDD 43X0845 BladeCenter PCI Expansion Unit 2 25K8373 BladeCenter PCI-Express I/O Expansion Unit 43W4391 SAS Expansion Card for IBM BladeCenter 39Y9190 | | | | | |

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
- 11 lbs; 5.0kg (max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics: F2 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each 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 and processor(s)

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

Maximum internal disk capacity for each LS22 blade server¹³:
292GB with two 146GB SAS disks

Other options at ibm.com/products/us

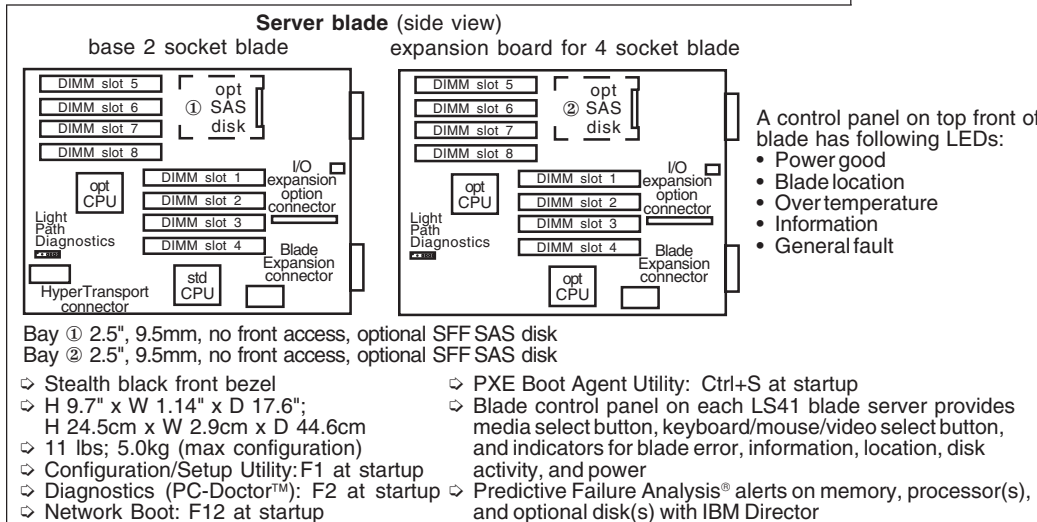
LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® part num 40Y5980)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5981)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 40Y5984)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5985)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 40Y5988)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5989)
- 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

** with 2000W power supply upgrade, * Express Models
excludes 115W models

| IBM® Type-model | Qty x Processor ¹ | Speed/Core | L2 Cache | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|--|--|------------|----------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|--|----------------|
| 7972-31U | 1 x Opteron 8212HE | 2.0GHz/DC | 2MB | 68W | 1GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7972-32U | 2 x Opteron 8212HE | 2.0GHz/DC | 2MB | 68W | 2GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Oct 2006 |
| 7972-3AU | 1 x Opteron 8212 | 2.0GHz/DC | 2MB | 95W | 1GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7972-3BU | 2 x Opteron 8212 | 2.0GHz/DC | 2MB | 95W | 2GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Oct 2006 |
| 7972-51U | 1 x Opteron 8216HE | 2.4GHz/DC | 2MB | 68W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7972-52U | 2 x Opteron 8216HE | 2.4GHz/DC | 2MB | 68W | 4GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Oct 2006 |
| 7972-6AU | 1 x Opteron 8218 | 2.6GHz/DC | 2MB | 95W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Oct 2006 |
| 7972-6BU | 2 x Opteron 8218 | 2.6GHz/DC | 2MB | 95W | 4GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Oct 2006 |
| 7972-E2U | 4 x Opteron 8216HE | 2.4GHz/DC | 2MB | 68W | 16GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Dec 2006 |
| Positioning Processor(s) | Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance Up to 4 x AMD Opteron 8000 Series Dual Core at up to 2.6GHz / simultaneously supports 32-bit and 64-bit computing | | | | | | | | | | | |
| L2 Cache | 1MB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O | | | | | | | | | | | |
| SMP support Implementation | 2 or 4-way SMP / up to four Opteron processors (same speed/cache size) Systemboard contains up to four LGA1207-pin sockets, up to sixteen DIMM slots, up to two Legacy Daughter Card connectors, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet | | | | | | | | | | | |
| Memory | 1, 2 or 4GB std / 16GB max ¹³ with double socket blade / 32 GB max ¹³ with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / PC5300 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), hardware scrubbing | | | | | | | | | | | |
| SAS disk controller | Up to two integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec / PCI-X 64-bit/133MHz / on planar / supports RAID 0, 1 / RAID-1, 1E & 5 with fully populated Storage and I/O Expansion blade / no cables or external connector | | | | | | | | | | | |
| SAS disk bays | Up to two non-hot-swap 2.5" SFF SAS disks / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit | | | | | | | | | | | |
| External storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | |
| Mechanical Architecture/Chipsets | Single or double slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 ServerWorks™ Chipset / Up to two HT2000 HyperTransport System I/O Controllers providing: PCI-Express bridges to Legacy Daughter Card connectors and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O | | | | | | | | | | | |
| Bus slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | |
| Ethernet controllers | Up to four gigabit Ethernet controllers / dual 10/100/1000 Ethernet controllers on single slot blade / Broadcom® BCM5706S / PCI-X 64-bit 133MHz bus / double socket blade adds Broadcom BCM5708S / dual10/100/1000 Ethernet controllers / PCI-Express / up to four full gigabit ethernet MAC and PHY layer functions / full-duplex / TCP/IP OffloadEngine (TOE) / iSCSI / Wake on LAN® / Serial over LAN / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Remote Direct Memory Access (RDMA) | | | | | | | | | | | |
| Network-interface | Up to two legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | |
| DVD / diskette / USB Kybd / video / mouse Graphics | None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | |
| Systems mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) | | | | | | | | | | | |
| Security | No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | |
| Software ship group | Documentation CD, Device Driver CD, ServerGuide CD | | | | | | | | | | | |
| Cooling fans | Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel | | | | | | | | | | | |
| Power supply Prerequisites | Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system | | | | | | | | | | | |
| | | | | | | | | | | | Dual Core AMD Opteron Processor Model 8212HE | 25R8934 |
| | | | | | | | | | | | Dual Core AMD Opteron Processor Model 8212 | 25R8932 |
| | | | | | | | | | | | Dual Core AMD Opteron Processor Model 8216HE | 25R8935 |
| | | | | | | | | | | | Dual Core AMD Opteron Processor Model 8218 | 25R8933 |
| | | | | | | | | | | | 1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit | 39M5861 |
| | | | | | | | | | | | 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit | 39M5864 |
| | | | | | | | | | | | 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit | 39M5867 |
| | | | | | | | | | | | 8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit* | 39M5870 |
| | | | | | | | | | | | IBM 36GB NHS 2.5" SFF SAS HDD | 26K5776 |
| | | | | | | | | | | | IBM 73GB NHS 2.5" SFF SAS HDD | 26K5777 |
| | | | | | | | | | | | BladeCenter Storage and I/O Expansion Blade | 39R7563 |
| | | | | | | | | | | | BladeCenter SFF Fibre Channel Expansion Card | 26K4841 |
| | | | | | | | | | | | BladeCenter SFF Gigabit Ethernet Expansion Card | 39R8624 |
| | | | | | | | | | | | QLLogic iSCSI Expansion Card for BladeCenter | 32R1923 |
| | | | | | | | | | | | QLLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter | 26R0890 |
| | | | | | | | | | | | Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter | 39Y9186 |
| | Other options at ibm.com/pc/us/accessories | | | | | | | | | | | |



LIMITED WARRANTY³

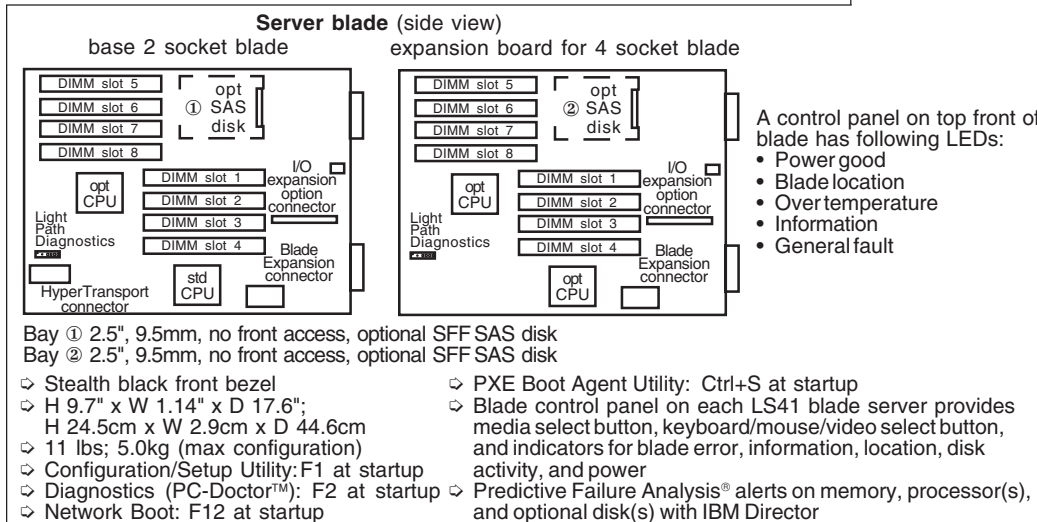
- ↔ 3 year parts and labor
- ↔ International Warranty Service³
- ↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↔ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® partnum 12x7014)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7015)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7018)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7019)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7022)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7023)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↔ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

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

| IBM® Type-model | Qty x Processor ¹ | Speed/Core | L2 Cache | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|------------------------------|------------|----------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|-------------|----------------|
| 7972-4TU | 2 x Opteron 8214HE | 2.2GHz/DC | 2MB | 68W | 2GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Feb 2007 |
| 7972-7AU | 1 x Opteron 8220 | 2.8GHz/DC | 2MB | 95W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Feb 2007 |
| 7972-7BU | 2 x Opteron 8220 | 2.8GHz/DC | 2MB | 95W | 4GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Feb 2007 |
| 7972-61U | 1 x Opteron 8218HE | 2.6GHz/DC | 2MB | 68W | 2GB | SAS | 1 fixed | SIO/PCIEU | up to 2 | single slot blade | 2 x Gigabit | Apr 2007 |
| 7972-62U | 2 x Opteron 8218HE | 2.6GHz/DC | 2MB | 68W | 4GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Apr 2007 |
| 7972-8BU | 2 x Opteron 8222 | 3.0GHz/DC | 2MB | 95W | 4GB | SAS | 2 fixed | SIO/PCIEU | up to 2 | double slot blade | 4 x Gigabit | Oct 2007 |

| | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) L2 Cache SMP support Implementation | Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance Up to 4 x AMD Opteron 8000 Series Dual Core at up to 3.0GHz / simultaneously supports 32-bit and 64-bit computing 1MB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O 2 or 4-way SMP / up to four Opteron processors (same speed/cache size) Systemboard contains up to four LGA1207-pin sockets, up to sixteen DIMM slots, up to two Legacy Daughter Card connectors, one Blade expansion connector, one HyperTransport Expansion connector, integrated graphics and Gigabit ethernet | | | | | | | | | | | |
| Memory | 1, 2 or 4GB std / 16GB max ¹³ with double socket blade / 32 GB max ¹³ with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / PC5300 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs / four DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / 2-way memory interleave / dual channel / Error Checking and Correcting (ECC) via 16-bit Checksum Chipkill™ (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), hardware scrubbing | | | | | | | | | | | |
| SAS disk controller | Up to two integrated / LSI Logic® 1064 SAS controller 1.5/3Gb/sec / PCI-X 64-bit/133MHz / on planar / supports RAID 0, 1 / supports RAID-1, 1E & 5 with fully populated Storage and I/O Expansion blade / no cables or external connector | | | | | | | | | | | |
| SAS disk bays | Up to two non hot-swap 2.5" SFF SAS disks / Supports up to three hot-swap SFF SAS disks in optional Storage and I/O Expansion Unit | | | | | | | | | | | |
| External storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | |
| Mechanical Architecture/Chipsets | Single or double slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 ServerWorks™ Chipset / Up to two HT2000 HyperTransport System I/O Controllers providing: PCI-Express bridges to Legacy Daughter Card connectors and Blade Storage Expansion connector, PCI-X bridge to LSI 1064 SAS, HyperTransport bridge to HT1000 South Bridge / HT1000 South Bridge provides: USB(2.0), ATI video, Dual GB ethernet, LPC bus to Winbond PC87427 for Super I/O | | | | | | | | | | | |
| Bus slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | |
| Ethernet controllers | Up to four gigabit Ethernet controllers / dual 10/100/1000 Ethernet controllers on single slot blade / Broadcom® BCM5706S / PCI-X 64-bit 133MHz bus / double socket blade adds Broadcom BCM5708S / dual10/100/1000 Ethernet controllers / PCI-Express / up to four full gigabit ethernet MAC and PHY layer functions / full-duplex / TCP/IP OffloadEngine (TOE) / iSCSI / Wake on LAN® / Serial over LAN / Alert Standard Format 2.0 / Failover, adapter fault tolerance / Remote Direct Memory Access (RDMA) | | | | | | | | | | | |
| Network-interface | Up to two legacy connector or PCI-Express connector for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | |
| DVD / diskette / USB Kybd / video / mouse Graphics | None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | |
| Systems mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS) | | | | | | | | | | | |
| Security | No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | |
| Software ship group | Documentation CD, Device Driver CD, ServerGuide CD | | | | | | | | | | | |
| Cooling fans | Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel | | | | | | | | | | | |
| Power supply Prerequisites | Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system | | | | | | | | | | | |
| | Dual Core AMD Opteron Processor Model 8214HE Dual Core AMD Opteron Processor Model 8218HE Dual Core AMD Opteron Processor Model 8220 Dual Core AMD Opteron Processor Model 8222 1GB (2x512) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 8GB (2x4GB) PC2-4200 CL4 ECC DDR2 VLP RDIMM Kit* IBM 36GB NHS 2.5" SFF SAS HDD IBM 73GB NHS 2.5" SFF SAS HDD BladeCenter Storage and I/O Expansion Blade BladeCenter SFF Fibre Channel Expansion Card BladeCenter SFF Gigabit Ethernet Expansion Card QLLogic iSCSI Expansion Card for BladeCenter QLLogic 4GB SFF Fibre Channel Expansion Card for BladeCenter Emulex 4GB SFF Fibre Channel Expansion Card for BladeCenter | | | | | | | | | | 40K1265 44E5247 40K1266 44R4951 39M5861 39M5864 39M5867 39M5870 26K5776 26K5777 39R7563 26K4841 39R8624 32R1923 26R0890 39Y9186 | |
| | Other options at ibm.com/pc/us/accessories | | | | | | | | | | | |



LIMITED WARRANTY³

- ↔ 3 year parts and labor
- ↔ International Warranty Service³
- ↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time⁷
- ↔ On site service upgrade options (in eligible locations):⁷
 - 3 year IOR 9x5, 4 hr avg response (ServicePac® partnum 12x7014)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7015)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7018)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7019)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac partnum 12x7022)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac partnum 12x7023)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↔ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

See footnotes for important warranty information

| 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 |
|-----------------|------------------------------|------------|----------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|----------|----------------|
| 7902-3QU | 2 x Opteron 8347HE | 1.9GHz/QC | 2MB | 79W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Sep 2008 |
| 7902-CQU | 2 x Opteron 8356 | 2.3GHz/QC | 2MB | 115W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Sep 2008 |
| 7902-EDU* | 4 x Opteron 8356 | 2.3GHz/QC | 2MB | 115W | 16GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Sep 2008 |
| 7902-1Sx | 2 x Opteron 8380 | 2.5GHz/QC | 2MB | 75W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Nov 2008 |
| 7902-3Sx | 2 x Opteron 8384 | 2.7GHz/QC | 2MB | 75W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Nov 2008 |
| 7902-ESU | 2 x Opteron 8384 | 2.7GHz/QC | 2MB | 75W | 8GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Nov 2008 |
| 7902-EUU | 4 x Opteron 8384 | 2.7GHz/QC | 2MB | 75W | 16GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Nov 2008 |

Positioning Processor(s) Up to 4 x AMD Opteron 8000 Series Quad Core at up to 2.7GHz / simultaneously supports 32-bit and 64-bit computing
L2 Cache **512KB** L2 Cache per core, **AMD Direct Connect Architecture** ensures lower latency I/O
SMP support Implementation **2 or 4-way SMP** / up to four Opteron processors (same speed/cache size)
 Systemboards contain four LGA 1207-pin sockets, sixteen VLP DIMM slots, two Legacy Daughter Card connectors, one Blade Expansion connector, one HyperTransport Expansion connector, integrated graphics, SAS and ethernet

Memory **4x1GB or 8x2GB** std / 64GB max¹³ / four or eight slots used / twelve or eight slots available / **PC2-5300** 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (std) / **PC2-6400** 800MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (opt) / 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 **LSI Logic®1064E SAS controller** / 1.5/3.0Gb/sec / PCI-Express / on planar / supports **RAID-1** / no cables or external connector

SAS disk bays Two fixed 2.5" SFF SAS disks

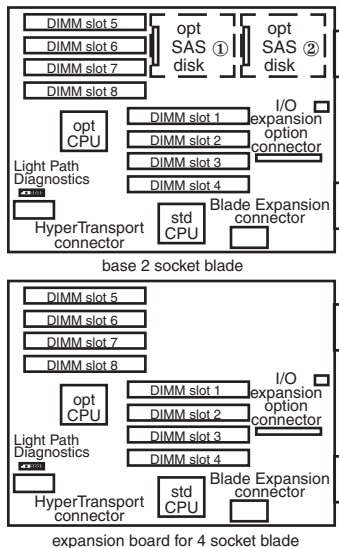
External storage Support for IBM TotalStorage™ solutions

Mechanical Architecture/Chipsets Single or double slot blade / Supported in IBM BladeCenter 8677**, 8852 and 8886
ServerWorks™ Chipset / HT2100 HyperTransport System I/O Controller provides: PCI-Express links to Blade Storage Expansion connector and PCI-Express Switch to SAS and Ethernet controllers, HyperTransport bridge to HT1000 South Bridge / **HT 1000 South Bridge** provides: Legacy Daughter Card connector via 64-bit PCI-X bus, USB, ATI video via 32-bit PCI bus, LPC bus to Winbond PC87427 for Super I/O / **HT 2000 HyperTransport System I/O Controller** provides: Legacy Daughter Card connector via 64-bit PCI-X bus and PCI-Express link to Ethernet controller
Bus slots No PCI or PCI-X slots (expansion via modules or network-interface option connector)

Ethernet controllers Up to four Gigabit Ethernet ports / up to two Broadcom® BCM5709S Gigabit Ethernet controllers / up to four full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full-duplex / TCP/IP OffloadEngine (TOE) / PXE 2.0 / Wake on LAN® / iSCSI / Serial over LAN / failover, adapter fault tolerance / load balancing / connects to optional, supported Ethernet switches or *Passthrough Modules* (requires a second optional switch or PM for failover)
Network-interface **Two legacy connectors for I/O expansion options** / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)

DVD / diskette / USB Kybd / video / mouse Graphics None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel
 None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel
 SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus

| | | | |
|-----------------------------------|---|--|---|
| Systems mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | Quad Core AMD Opteron Processor Model 8347HE Quad Core AMD Opteron Processor Model 8356 LS42 Multi Processor Expansion Unit with 2 x 8380 processors LS42 Multi Processor Expansion Unit with 2 x 8384 processors | 44X1552 44R4917 46M6817 44X1685 |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via Preboot DSA) | 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 8GB (2x4GB) PC2-5300 CL4 ECC DDR2 VLP RDIMM Kit 8GB (2x4GB) PC2-6400 CL4 ECC DDR2 VLP RDIMM Kit | 46C0522 46C0512 46C7524 46C7525 |
| Security | Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | IBM 73GB NHS 2.5" 10K SFF SAS HDD IBM 146GB NHS 2.5" 10K SFF SAS HDD IBM 73GB NHS 2.5" 15K SFF SAS HDD | 26K5777 42D0421 43X0845 |
| Software ship group | Documentation CD, Device Driver CD, ServerGuide CD | BladeCenter PCI Expansion Unit 2 BladeCenter PCI-Express I/O Expansion Unit | 25K8373 43W4391 |
| Cooling fans | Uses cooling from BladeCenter (types 8677**, 8852 and 8886) / thermal sensors on each processor and BladeCenter modules and front panel | | |
| Power supply Prerequisites | Uses power modules in BladeCenter (types 8677**, 8852 and 8886) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677**, 8852 and 8886), operating system | | Other options at ibm.com/products/us |



- ▷ Stealth black front bezel
- ▷ H 9.7" x W 2.28" x D 17.6"
- ▷ H 24.5cm x W 5.8cm x D 44.6cm
- ▷ 25 lbs; 11kg (max configuration)
- ▷ Configuration/Setup Utility: F1 at startup
- ▷ Diagnostics: F2 at startup
- ▷ Network Boot: F12 at startup
- ▷ PXE Boot Agent Utility: Ctrl+S at startup
- ▷ Blade control panel on each 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 and processor(s)

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

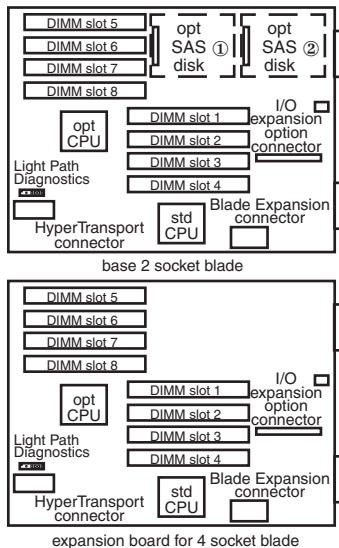
Maximum internal disk capacity for each LS42 blade server¹³:
 292GB with two 146GB SAS disks

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 9x5, 4 hr avg response (ServicePac® part num 40Y5980)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5981)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 40Y5984)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5985)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 40Y5988)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5989)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Qty x Processor ¹ | Speed/Core | L2 Cache | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|------------------------------|--------------|----------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|----------|----------------|
| 7902-3Lx | 2 x Opteron 8376 | HE 2.3GHz/4C | 2MB | 55W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7902-HVx | 4 x Opteron 8384 | 2.7GHz/4C | 2MB | 55W | 16GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Mar 2009 |
| 7902-ELx* | 2 x Opteron 8376 | HE 2.3GHz/4C | 2MB | 55W | 8GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Mar 2009 |
| 7902-EMx* | 4 x Opteron 8376 | HE 2.3GHz/4C | 2MB | 55W | 16GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Mar 2009 |
| 7902-61x | 2 x Opteron 8431 | 2.4GHz/6C | 3MB | 75W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Aug 2009 |
| 7902-62x | 2 x Opteron 8435 | 2.6GHz/6C | 3MB | 75W | 4GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Aug 2009 |
| 7902-E6x* | 2 x Opteron 8431 | 2.4GHz/6C | 3MB | 75W | 8GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | single slot blade | 2 x Gb | Aug 2009 |
| 7902-E7x* | 4 x Opteron 8435 | 2.6GHz/6C | 3MB | 75W | 16GB | SAS | 2 fixed | PCIEU/PEU2 | up to 2 | double slot blade | 4 x Gb | Aug 2009 |

| | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Positioning Processor(s) | Ultra-dense, up to 4 socket, full performance modular computing platform with superior performance Up to 4 x AMD Opteron 8000 Series / Six-Core at up to 2.6GHz / Four-Core at up to 2.7GHz / simultaneously supports 32-bit and 64-bit computing | | | | | | | | | | | |
| L2 Cache SMP support Implementation | 512KB L2 Cache per core, AMD Direct Connect Architecture ensures lower latency I/O 2 or 4-way SMP / up to four Opteron processors (same speed/cache size) Systemboards contain four LGA 1207-pin sockets, sixteen VLP DIMM slots, two Legacy Daughter Card connectors, one Blade Expansion connector, one HyperTransport Expansion connector, integrated graphics, SAS and ethernet | | | | | | | | | | | |
| Memory | 4x1GB or 8x2GB std / 128GB max¹³ / four or eight slots used / twelve or eight slots available / PC2-5300 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (std) / PC2-6400 800MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (opt) / eight DIMM gold-connector slots on systemboard / eight DIMM gold-connector slots on multiprocessor expansion unit / 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 | LSI Logic®1064E SAS controller / 1.5/3.0Gb/sec / PCI-Express / on planar / supports RAID-1 / no cables or external connector | | | | | | | | | | | |
| SAS disk bays | Two fixed 2.5" SFF SAS disks | | | | | | | | | | | |
| External storage | Support for IBM TotalStorage™ solutions | | | | | | | | | | | |
| Mechanical Architecture/Chipsets | Single or double slot blade / Supported in IBM BladeCenter 8677**, 8852 and 8886 / single-slot LS42 upgradeable to double-slot via multiprocessor expansion unit (MPE) ServerWorks™ Chipset / HT2100 HyperTransport System I/O Controller provides: PCI-Express links to Blade Storage Expansion connector and PCI-Express Switch to SAS and Ethernet controllers, HyperTransport bridge to HT1000 South Bridge / HT 1000 South Bridge provides: Legacy Daughter Card connector via 64-bit PCI-X bus, USB, ATI video via 32-bit PCI bus, LPC bus to Winbond PC87427 for Super I/O / HT 2000 HyperTransport System I/O Controller provides: Legacy Daughter Card connector via 64-bit PCI-X bus and PCI-Express link to Ethernet controller | | | | | | | | | | | |
| Bus slots | No PCI or PCI-X slots (expansion via modules or network-interface option connector) | | | | | | | | | | | |
| Ethernet controllers | Up to four Gigabit Ethernet ports / up to two Broadcom® BCM5709S Gigabit Ethernet controllers / up to four full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full-duplex / TCP/IP OffloadEngine (TOE) / PXE 2.0 / Wake on LAN® / iSCSI / Serial over LAN / failover, adapter fault tolerance / load balancing / connects to optional, supported Ethernet switches or <i>Passthrough Modules</i> (requires a second optional switch or PM for failover) | | | | | | | | | | | |
| Network-interface | Two legacy connectors for I/O expansion options / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card) | | | | | | | | | | | |
| DVD / diskette / USB Kybd / video / mouse Graphics | None / requests for DVD-ROM, diskette drive, and USB port in BladeCenter by pressing media select button on front control panel None / requests for keyboard, mouse, and video in BladeCenter by pressing the display button on front control panel SVGA / ATI® Radeon® RN50 on planar / 16MB DDR std/max / 32-bit 33MHz PCI 2.2 bus | | | | | | | | | | | |
| Systems mgmt | IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via Preboot DSA) | | | | | | | | | | | |
| Security | Power-on password / administrator password / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | |
| Software ship group | Documentation CD, Device Driver CD, ServerGuide CD Uses cooling from BladeCenter (types 8677**, 8852 and 8886) / thermal sensors on each processor and BladeCenter modules and front panel Uses power modules in BladeCenter (types 8677**, 8852 and 8886) | | | | | | | | | | | |
| Cooling fans | Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677**, 8852 and 8886), operating system | | | | | | | | | | | |
| Power supply Prerequisites | LS42 Multi Processor Expansion Unit with 2 x 8431 processors 49Y4748 LS42 Multi Processor Expansion Unit with 2 x 8435 processors 49Y4749 LS42 Multi Processor Expansion Unit with 2 x 8380 processors 46M6817 LS42 Multi Processor Expansion Unit with 2 x 8384 processors 44X1685 LS42 Multi Processor Expansion Unit with 2 x 8374 HE processors 46M6885 LS42 Multi Processor Expansion Unit with 2 x 8376 HE processors 46M6890 2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 46C0522 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit 46C0512 8GB (2x4GB) PC2-5300 CL4 ECC DDR2 VLP RDIMM Kit 46C7524 8GB (2x4GB) PC2-6400 CL4 ECC DDR2 VLP RDIMM Kit 46C7525 16GB (2x8GB) PC2-4200 CL5 ECC DDR2 VLP RDIMM Kit 44T1547 IBM 73GB NHS 2.5" 10K SFF SAS HDD 26K5777 IBM 146GB NHS 2.5" 10K SFF SAS HDD 42D0421 IBM 73GB NHS 2.5" 15K SFF SAS HDD 43X0845 BladeCenter PCI Expansion Unit 2 25K8373 BladeCenter PCI-Express I/O Expansion Unit 43W4391 | | | | | | | | | | | |



- ◇ Stealth black front bezel
 - ◇ H 9.7" x W 2.28" x D 17.6"
 - ◇ H 24.5cm x W 5.8cm x D 44.6cm
 - ◇ 25 lbs; 11kg (max configuration)
 - ◇ Configuration/Setup Utility: F1 at startup
 - ◇ Diagnostics: F2 at startup
 - ◇ Network Boot: F12 at startup
 - ◇ PXE Boot Agent Utility: Ctrl+S at startup
 - ◇ Blade control panel on each 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 and processor(s)
- A control panel on top front of blade has following LEDs:
Power good
Blade location
Over temperature
Information

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

Maximum internal disk capacity for each LS42 blade server³:
292GB with two 146GB 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 9x5, 4 hr avg response (ServicePac® part num 40Y5980)
 - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5981)
 - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 40Y5984)
 - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5985)
 - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 40Y5988)
 - 5 year IOR 24x7, 4 hr avg response (ServicePac part num 40Y5989)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7¹⁴ toll-free support for warranty issues during the warranty period³

| IBM® Type-model | Processor | GHz¹ | Core | L2 cache | FSB MHz | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|---|--|--------|----------------|------------------------|-------------|-------|--------|-----------------|-----------|-----------------|---|-------------------|--------------|----------------|
| 0792-xxx | Cell/B.E.™ | 3.2GHz | 1 PPE 8 SPE | 512KB/PPE 256KB/SPE | 5GB/ sec | 300 | 2x1GB | N/A | None | None | None | Single-slot blade | Dual Gigabit | October 2007 |
| Positioning Processor(s) | High-performance blade solution for graphics-intensive and single precision floating point high performance computing (HPC) applications Two 64-bit, 3.2 GHz Cell Broadband Engine™ processors. The asymmetric multi-core processor includes a Power Processor Element (PPE) and eight SIMD engines called Synergistic Processor Elements (SPE) | | | | | | | | | | | | | |
| SMP - L2 Cache Implementation | 512 KB per Cell/B.E. Processor, and 256 KB of local store memory for each SPE Server blade contains two Cell Broadband Engine microprocessors soldered to planar, 2GB XDR system memory, four DIMM slots for I/O buffer memory, PCI-X, Serial Attached SCSI (SAS) expansion card option, I/O expansion option, and dual Gigabit Ethernet | | | | | | | | | | | | | |
| Memory | 2 GB (1 GB of error checking and correction (ECC) memory per Cell/B.E. chip) / 4 DIMM slots (2 slots / Cell/B.E. companion chip) for optional special purpose I/O Buffer DDR2 VLP DIMMs. Special purpose I/O buffer memory is unlike "system" memory in that client applications must be written specifically to utilize it. | | | | | | | | | | | | | |
| Disk Controller | N/A | | | | | | | | | | | | | |
| Disk bays | None | | | | | | | | | | | | | |
| External Storage | Support for IBM TotalStorage™ solutions through DS3200 Boot Disk System / Optional Serial Attached SCSI (SAS) daughter card connected via PCI-X (CFFv) which can be used to connect to the BladeCenter Boot Disk System through a SAS switch module in the chassis | | | | | | | | | | | | | |
| Mechanical Architecture/Chipset BUS slots | Single-wide Blade supported in BladeCenter H Type 8852 and BladeCenter HT Type 8740 and 8750 units Cell Broadband Engine multi-core processor / IBM companion chip No 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 One connector for I/O expansion option / one connector for Serial Attached SCSI (SAS) option requiring same interface modules in bays 3 and 4 of BladeCenter | | | | | | | | | | | | | |
| 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 N/A None | | | | | | | | | | | | | |
| Systems Mgmt | IBM Integrated Baseboard Management Controller (BMC) / BladeCenter Advanced Management Module Web interface / IPMI 1.5 / IBM Active Energy Manager® / IBM Director | | | | | | | | | | | | | |
| Diagnostics | Light Path Diagnostics (LED lights indicate failing component) and on-board diagnostics (in host firmware) | | | | | | | | | | | | | |
| Security | No security intrusion protection / Power-on password / administrator password (via AMM) / unattended boot / selectable boot / unattended start mode | | | | | | | | | | | | | |
| Software ship group | Documentation CD | | | | | | | | | | | | | |
| Cooling Fans | Uses cooling from BladeCenter chassis / thermal sensors on each processor and BladeCenter modules and front panel | | | | | | | | | | | | | |
| Power supply(s) | Uses power module(s) in BladeCenter chassis | | | | | | | | | | | | | |
| Prerequisites | Monitor, keyboard, mouse via rack console for setup; Ethernet switch modules; BladeCenter H Type 8852 or BladeCenter HT Type 8740 or 8750; Red Hat Enterprise Linux 5.1 operating system; storage device (no built-in disk storage) | | | | | | | | | | | | | |
| | | | | | | | | | | | 512 MB VLP DIMMs (Qty 2) as I/O Buffer Memory | | 39M5861 | |
| | | | | | | | | | | | Cisco 4x InfiniBand Adapter | | 32R1760 | |
| | | | | | | | | | | | SAS expansion card for IBM BladeCenter | | 39Y9190 | |

Server blade

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

- Power good
- Blade location
- Activity
- Information
- General fault

- Raven 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
- 12lbs; 5.44kg (max configuration)
- Cell Broadband Engine 300W
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Blade control panel on each QS21 blade server provides media select button, and indicators for blade error, information, location, and power

LIMITED WARRANTY³

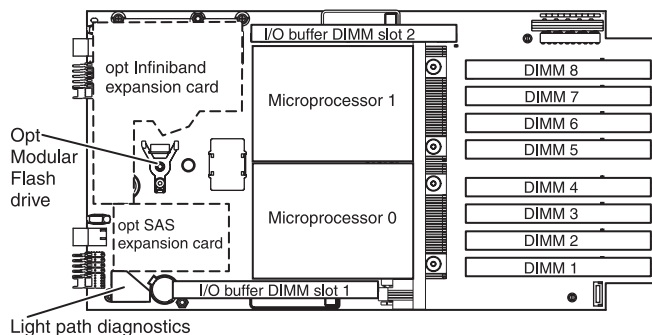
- 1 year parts and labor
- International Warranty Service³
- Customer Replaceable Unit (CRU) and On-site Service*
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **24x7¹⁴ telephone support for warranty issues during the warranty period³**

(*) IBM will determine which type of warranty service is appropriate for the repair

| IBM® Type-model | Processor | GHz ¹ | Core | L2 cache | FSB MHz | Watts | Memory | Disk controller | Disk bays | Expansion Units | I/O slots | Mechanical | Ethernet | Available date |
|-----------------|----------------|------------------|----------------|---------------------|-------------|-------|--------|-----------------|-----------|-----------------|-----------|-------------------|--------------|----------------|
| 0793-38y | PowerXCell™ 8i | 3.2 GHz | 1 PPE 8 SPE | 512KB/ processor | 5GB/ sec | 250W | 8x1GB | N/A | None | None | None | Single-slot blade | Dual Gigabit | June 2008 |
| 0793-40y | PowerXCell™ 8i | 3.2 GHz | 1 PPE 8 SPE | 512KB/ processor | 5GB/ sec | 265W | 4x4GB | N/A | None | None | None | Single-slot blade | Dual Gigabit | June 2008 |

| | |
|---|---|
| Positioning Processor(s) | Premier blade for high performance computing (HPC) double precision floating point workloads that require a large amount of CPU memory Two IBM PowerXCell 8i processor chips operating at 3.2 GHz / The asymmetric multi-core processor includes a Power Processor Element (PPE) and eight SIMD engines called Synergistic Processor Elements (SPE) with enhanced Double Precision (eDP) |
| SMP - L2 Cache Implementation | 512 KB per IBM PowerXCell 8i / 256 KB of local store memory for each SPE Server blade contains two IBM PowerXCell 8i processors and companion chips soldered to planar, eight DIMM slots for system memory, two DIMM slots for optional special purpose I/O buffer memory, PCI-X, Serial Attached SCSI (SAS) expansion card option, I/O expansion option, dual Gigabit Ethernet, and optional 8 GB Modular Flash Drive for system boot or local storage |
| Memory | 8 DDR2 PC2-6400 VLP DIMM slots (4 slots per IBM PowerXCell 8i) for system memory with error checking and correction capability (1 GB or 4 GB memory modules); 32GB maximum. Additionally, 2 DIMM slots (1 slot per IBM PowerXCell 8i companion chip) for optional special purpose I/O Buffer 1GB DDR2 VLP DIMMs. Special purpose I/O buffer memory is unlike "system" memory in that client applications must be written specifically to utilize it. / optional 8 GB Modular Flash Drive for system boot or local storage |
| Disk Controller Disk bays External Storage | N/A None Support for IBM TotalStorage™ solutions through DS3200 Boot Disk System / Optional Serial Attached SCSI (SAS) daughter card connected via PCI-X (CFV) which can be used to connect to the BladeCenter Boot Disk System through a SAS switch module in the chassis |
| Mechanical Architecture/Chipset BUS slots | Single-wide Blade supported in BladeCenter H Type 8852 IBM PowerXCell 8i processor / IBM companion chip No 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 One connector for I/O expansion option / one connector for Serial Attached SCSI (SAS) options requiring the same interface modules in bays 3 and 4 of BladeCenter |
| 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 N/A None |
| Systems Mgmt | IBM Integrated Baseboard Management Controller (BMC) / BladeCenter Advanced Management Module Web interface / IPMI 1.5 / IBM Systems Director Active Energy Manager® / IBM Director |
| Diagnostics | Light Path Diagnostics (LED lights indicate failing component) and on-board diagnostics (in host firmware) |
| Security | No security intrusion protection / Power-on password / administrator password (via AMM) / unattended boot / selectable boot / unattended start mode |
| Software ship group | Documentation CD |
| Cooling Fans Power supply(s) Prerequisites | Uses cooling from BladeCenter chassis / thermal sensors on each processor and BladeCenter modules and front panel Uses power module(s) in BladeCenter chassis Monitor, keyboard, mouse via rack console for setup; Ethernet switch modules; BladeCenter H Type 8852; Red Hat Enterprise Linux 5.2 operating system; storage device (no built-in disk storage) |
| | 1GB VLP DDR2 system memory 2GB DIMM Kit (2x1GB) VLP DDR2 system memory 4GB DIMM VLP DDR2 system memory 8GB DIMM Kit (2x4GB) VLP DDR2 system memory 2GB DIMM Kit (2x1GB) VLP DDR2 I/O buffer memory High-speed SDR InfiniBand expansion card SAS expansion card 8 GB Modular Flash Drive |
| | 46C0500 46C0501 46C0504 46C0510 46C0501 32R1760 39Y9190 43W3934 |

Server blade



- Raven 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
- 12lbs; 5.44kg (max configuration)
- Two IBM PowerXCell 8i 300W (with 32GB)
- Configuration/Setup Utility: F1 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- Blade control panel on each QS22 blade server provides media select button, and indicators for blade error, information, location, and power

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

- Power good
- Blade location
- Activity
- Information
- General fault

LIMITED WARRANTY³

- 3 year parts and labor
- International Warranty Service³
- Customer Replaceable Unit (CRU) and On-site Service*
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **24x7¹⁴ telephone support for warranty issues during the warranty period³**

(*) IBM will determine which type of warranty service is appropriate for the repair

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

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

² MB/GB/TB = 1 million/billion/trillion bytes when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition.

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

⁴ A single "U", or rack unit, is 1.75" or 44.45mm.

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

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

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

⁸ Subject to conditions.

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

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

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

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

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

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

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

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

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

¹⁸ Diskettes and hard copy documentation available at extra charge.

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

²⁰ Statement of direction and subject to availability.

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

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



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December 31, 2008 - usxref.pdf