

# IBM STG Field Skills Education

System x Reference (xREF)



## System x Reference (xREF)

including

**IBM®**  
System x® & BladeCenter®

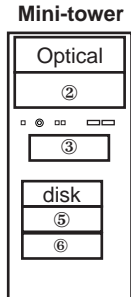
**February 8, 2011**



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

IBM® Machine Type	Model	Processor	Speed <sup>1</sup> /Core	L3 Cache	Memory	Disk	Disk controller	Maximum Capacity	Optical	Slots x bays	Hard disk bays	Ethernet	Available date
4253 - 22x	Celeron® G1101	2.26GHz/2C	2MB	1x1GB	1x250GB	SATA (embedded RAID)	4TB	DVD-ROM	4 x 6	4 fixed	Gigabit	Mar 2010	
4253 - 42x	Pentium® G6950	2.8GHz/2C	3MB	1x1GB	2x250GB	SATA (embedded RAID)	4TB	DVD-ROM	4 x 6	4 fixed	Gigabit	Mar 2010	
4253 - 62x	Core™ i3-540	3.06GHz/2C	4MB	1x2GB	2x250GB	SATA (embedded RAID)	4TB	DVD-ROM	4 x 6	4 fixed	Gigabit	Mar 2010	
4253 - B2x	Xeon® X3430	2.4GHz/4C	8MB	1x2GB	1x250GB	SATA (embedded RAID)	4TB	DVD-ROM	4 x 6	4 fixed	Gigabit	Apr 2010	
4253 - D2x	Xeon X3450	2.66GHz/4C	8MB	1x2GB	2x250GB	SATA (hardware RAID)	4TB	DVD-ROM	4 x 6	4 fixed	Gigabit	Apr 2010	

Positioning Processor(s)	<b>Single socket, entry server engineered for small businesses</b> One Intel® processor at up to 2.66GHz with 1333MHz FSB and 8MB L3 / up to 4 Core / Xeon and Core with Intel Turbo Boost and Hyper-Threading / all Optimized for Extended Memory 64 Technology (EM64T)		
L3 cache Implementation	8MB std on Xeon / 4MB std on Core / 3MB std on Pentium / 2MB std on Celeron		
SMP support	Systemboard contains one LGA-1156 socket, four DIMM sockets, four slots(1 PCI Express x16, 1 PCI Express x8, 1 PCI Express x4, and 1 PCI), integrated SATA and Gigabit Ethernet. No SMP support / no processor upgrade		
Memory	<b>1 or 2GB</b> std / 16GB <sup>13</sup> max / four 240-pin gold-plated DIMM sockets / <b>PC3-10600 1333MHz ECC DDR3-SDRAM</b>		
SATA controller	Six channel SATA controller (3.0GB/sec) / integrated / supports up to four drives standard / RAID 0/1/ upgradeable to hardware RAID 0/1 via ServeRaid-BR10iI option (std on D2x)		
Disk	One or two 250GB SATA HDD standard		
Rack support Bus slots (see below)	Support via tower-to-rack kit option One PCI-E x16 slot / one PCI-E x8 slot / one PCI-E x4 slot / one 32-bit 33MHz 5v PCI 2.2 slot		
Chipset	<b>Intel 3420 chipset</b> / Platform Controller Hub (PCH) for PCI 2.2, SATA, USB, Low Pin Count Interface / Firmware Hub		
Ethernet	Gigabit Ethernet port / Intel WG82574L / 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 / optional USB only <i>Front:</i> two USB(2.0); <i>Rear:</i> one serial(9-pin), four USB(2.0), ethernet(RJ-45), video(DB-15)		
Diagnostics	Diagnostic LEDs / error LEDs for fans and memory / PC Doctor diagnostic program stored on IBM Diagnostics CD		
Systems Management	Aspeed AST-2050 A3 BMC Controller / IPMI 2.0 / SOL / upgradeable to <b>Remote Presence</b> via IBM Virtual Media Key		
Graphics controller	SVGA / 8MB SDRAM std/max / integrated in BMC on systemboard		
Security	Mechanical side panel key lock / power-on password / boot sequence control / operation without kybd/mouse		
Keyboard / mouse	Optional / USB only	1GB 1Rx8 PC3-10600 DDR3-1333 LP UDIMM 2GB 2Rx8 PC3-10600 DDR3-1333 LP UDIMM 2GB 1Rx8 PC3-10600 DDR3-1333 LP UDIMM 4GB 2Rx8 PC3-10600 DDR3-1333 LP UDIMM IBM 250GB SATA II (7.2K) simple-swap HDD IBM 500GB SATA II (7.2K) simple-swap HDD IBM Server 1TB 7200 SATA 3.5" SS HDD IBM DDS Generation 5 USB Tape Drive IBM DDS Generation 6 USB Tape Drive IBM 400/800 GB HH LTO3 SAS Tape Drive IBM Tower to rack conversion kit IBM 3Gb SAS HBA v2 ServeRAID-BR10iI SAS/SATA Controller v2 Intel PRO/1000 PT Dual Port Server adapter IBM Virtual Media Key	44T1568 44T1569 44T1570 44T1571 39M4508 39M4514 42W7622 46C5399 39M5636 43W8478 42C8923 44E8700 49Y4731 39Y6126 49Y7290
Cooling fans	Two variable speed fans (rear, power supply) / not redundant / not hot-swap		
Power supply	350 watts / universal / manual switching / Automatic Server Restart (ASR) / not hot-swap / not redundant / cooling fan in power supply		
Other options at <a href="http://ibm.com">ibm.com</a>			



- 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, open
- Bay ⑤ 3.5", SL 1", access, open
- Bay ⑥ 3.5", SL 1", access, open

- Slot 1: full height, full length PCI-E x16 (x8 electrical)
- Slot 2: full height, full length PCI-E x8 (x8 electrical)
- Slot 3: full height, full length PCI-E x4 (x4 electrical)
- Slot 4: fullsize, 32-bit 33MHz, PCI 2.2 (5v)

**Stealth black**

- ✦ 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 438mm x W 216mm x D 540mm
- ✦ 33 to 40 pounds (15 to 18kg)
- ✦ Maximum internal disk capacity<sup>13</sup>: 4TB with four 1TB SATA disks

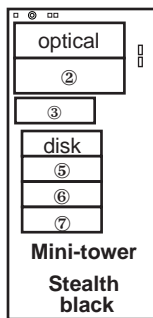
**LIMITED WARRANTY<sup>3</sup>**

- ⇨ 1 year parts and labor
- ⇨ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇨ On site service upgrade options (in eligible locations):<sup>7</sup>  
3 year IOR 24x7, 4 hr avg response (ServicePac part num xxxxxxx)
- ⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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	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> <b>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)</b>											
L2 cache Implementation	<b>2MB</b> std on Core 2 Duo / <b>6 or 12MB</b> 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	<b>512MB or 1GB</b> std / 8GB <sup>13</sup> max / four 184-pin gold-plated DIMM sockets / one or two socket used / <b>PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)</b> / DIMMs and ECC memory controller / industry std / unbuffered											
SAS/SATA controller	<b>LSI Logic® 1064e</b> / daughter card / supports SAS or SATA drives / four-port / PCI-Express / <b>RAID 0,1 / hot-swap models</b>											
SATA controller Cables Disk	Four channel SATA controller (3.0GB/sec) / supports 4 drives standard / integrated / simple-swap models 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 <sup>4</sup> 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 <b>optional</b> 64-bit 133MHz PCI-X slot											
Chipset	<b>Intel 3210 chipset</b> / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI 2.2, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / <b>SMSC® SCH5027</b> 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 / <b>secure remote power on/off / support for optional Remote Supervisor Adapter II</b>											
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	<b>ServerGuide™</b> (CD-based automated network OS installation and configuration tool), IBM Director (system hardware management software) and many utilities											
Keyboard / mouse Cooling fans	None standard 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)											
	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](http://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:  
3TB<sup>13</sup> (4 disks x 750GB)  
Maximum hot-swap SAS capacity:  
584GB<sup>13</sup> (4 disks x 146GB)

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

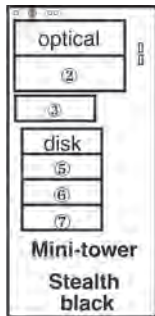
- ⇨ 1 year parts and labor standard 4367MTM
- ⇨ 3 year parts and labor standard 4368 MTM
- ⇨ International Warranty Service<sup>3</sup>
- ⇨ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇨ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 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>
- ⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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	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	BDY	Xeon E5300 2.6GHz/DC	800	2MB	2x512MB	Open/SATA(no RAID)	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(no RAID)	4 x 7	4 simple-swap	1x400W	Gigabit	June 2009
4367/4368	35Y	Xeon E3110 3.0GHz/DC	1333	6MB	2x512MB	Open/SATA(no RAID)	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 <b>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)</b>										
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	<b>512MB, 1 or 2GB</b> std / 8GB <sup>13</sup> max / four 184-pin gold-plated DIMM sockets / one or two socket used / <b>PC2-6400 800MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC)</b> / DIMMs and ECC memory controller / industry std / unbuffered										
SAS/SATA controller	<b>LSI Logic® 1064e</b> / daughter card / supports SAS or SATA drives / four-port / PCI-Express / <b>RAID 0,1 / hot-swap models</b>										
SATA controller	Four channel SATA controller (3.0Gb/sec) / supports 4 drives standard / integrated / 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 <sup>4</sup> 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 <b>optional</b> 64-bit 133MHz PCI-X slot										
Chipset	<b>Intel 3210 chipset</b> / Memory Controller Hub (MCH) / I/O Controller Hub (ICH9R) for PCI 2.2, ethernet MAC, USB, Low Pin Count Interface / Firmware Hub / <b>SMSC® SCH5027</b> 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 <sup>5</sup>										
Optical / diskette Ports	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										
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 system and processor temperature, fan speed and failure, and voltages / <b>secure remote power on/off / support for optional Remote Supervisor Adapter II</b>										
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	<b>ServerGuide™</b> (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)	43N8265
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](http://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
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- 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
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- ◇ H 448mm x W 215.9mm x D 539.75mm
- ◇ 36 to 56 pounds (16.3 to 25.2kg)

Maximum SATA capacity:  
4TB<sup>13</sup> (4 disks x 1TB)  
Maximum hot-swap SAS capacity:  
584GB<sup>13</sup> (4 disks x 146GB)

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

- ⇒ 1 year parts and labor standard 4367MTM
- ⇒ 3 year parts and labor standard 4368 MTM
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac part num 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>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Machine Type	Machine 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/4C	1333MHz	8MB	2x1GB	Open/SATA	4 x 7	4 simple-swap	1x401W	2 x Gb	Oct 2009
7327/7328	C2x	Xeon X3430 2.4GHz/4C	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/4C	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/4C	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/4C	1333MHz	8MB	2x1GB	Open/SAS/SATA	4 x 7	4 hot-swap	1x401W	2 x Gb	Oct 2009
7328	E3x	Xeon X3430 2.4GHz/4C	1333MHz	8MB	2x4GB	Open/SAS/SATA	4 x 7	4 hot-swap	1x401W	2 x Gb	Nov 2009
7328	E4x	Xeon X3450 2.67GHz/4C	1333MHz	8MB	2x4GB	Open/SAS/SATA	4 x 7	4 hot-swap	2x430W	2 x Gb	Nov 2009
7328	E6x	Xeon X3430 2.4GHz/4C	1333MHz	8MB	2x2GB	Open/SAS/SATA	4 x 7	4 hot-swap	1x401W	2 x Gb	June 2010
7327/7328	A2x	Pentium® G6950 2.8GHz/2C	1333MHz	3MB	1x1GB	Open/SATA	4 x 7	4 simple-swap	1x401W	2 x Gb	Oct 2010
7327/7328	B2x	Core® i3 540 3.06GHz/	1333MHz	4MB	1x1GB	Open/SATA	4 x 7	4 simple-swap	1x401W	2 x Gb	Oct 2010

Positioning Processor(s) *Single socket, entry server for small and medium size businesses and distributed enterprises*  
 One Intel® processor at up to 3.06GHz with 1333MHz FSB and up to 8MB L3 / up to 4 Core / Xeon and Core with Intel Turbo Boost and Hyper-Threading / all Optimized for Extended Memory 64 Technology (EM64T)

L3 cache 8MB std on Xeon / 4MB std on Core / 3MB std on Pentium

Implementation 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 **Up to 8GB std / 32GB<sup>13</sup> 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<sup>4</sup> 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 std on most / DVD multiburner, SATA std on E6x / None standard

Diagnosics *Front: two USB (2.0); Rear: one serial (9-pin), four USB (2.0), two ethernet (RJ45) and video*

Systems Management Diagnostic LEDs / error LEDs for fans and memory / preboot DSA integrated on systemboard

Integrated Management Module (IMM) / VSC452 / H852461 / 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 / 16MB 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

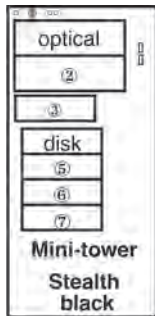
Keyboard / mouse Optional

Cooling fans Four fans (cpu, rear, pwr supply & HDD cage) / not redundant / not hot-swap

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)

1GB PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM	44T1480
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
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

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



Slot 1: half-length, PCI-E x8 (x8 electrical)  
 Slot 2: half-length, PCI-E x8 (x8 electrical)  
 Slot 3: fullsize, PCI-E x4 (x1 electrical)  
 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, 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

- ❖ 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 438mm x W 216mm x D 540mm
- ❖ 43 to 47 pounds (19.6 to 21.4kg)

Maximum SATA capacity:  
 4TB<sup>13</sup> (4 disks x 1TB)  
 Maximum hot-swap SAS capacity:  
 584GB<sup>13</sup> (4 disks x 146GB)

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

- 1 year parts and labor standard 7327 MTM
- 3 year parts and labor standard 7328 MTM
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Machine Type	model	Processor / Speed / Core	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr <sup>3</sup>	Available date
4190/4194 22Y		Core™ 2 Duo E4600 2.4GHz/DC	2MB	800	2 x 512MB	SATA (no RAID)	2 simple-swap	1U <sup>4</sup> 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 / 8GB<sup>13</sup> 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 / hot-swap models**  
 SATA controller Four channel SATA controller (3.0Gb/sec) / 2 drives supported / integrated into South Bridge / simple-swap models / RAID optional 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 (1U<sup>4</sup>)** / 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

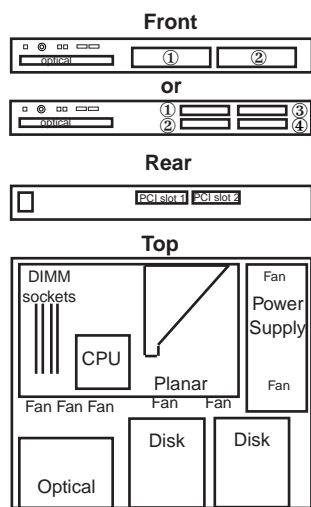
Diagnostics Diagnostic LEDs/ Error LEDs for fans and memory/ Diagnostics via PC-Doctor on a standard IBM Enhanced Diagnostics CD (diskette can be created) / support for optional slimline Remote Supervisor Adapter II with dedicated slot on planar for continuous power (no external power required)

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](http://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 capacity<sup>13</sup> (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 WARRANTY<sup>3</sup>**

- ⇒ 1 year parts and labor standard 4190 MTM
- ⇒ 3 year parts and labor standard 4194 MTM
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, NBD avg response (ServicePac part num 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>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Machine Type	Model	Processor / Speed / Core	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr <sup>3</sup>	Available date
4190/4194	42Y	Xeon® E3120 3.16GHz/2C	6MB	1333	2 x 512MB	SAS/SATA	2 hot-swap	1U <sup>4</sup> 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 / **8GB<sup>13</sup>** 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 / hot-swap models**  
 SATA controller Four channel SATA controller (3.0Gb/sec) / 2 drives supported / integrated into South Bridge / simple-swap models / RAID optional 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 (1U<sup>4</sup>)** / 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<sup>5</sup>** 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)

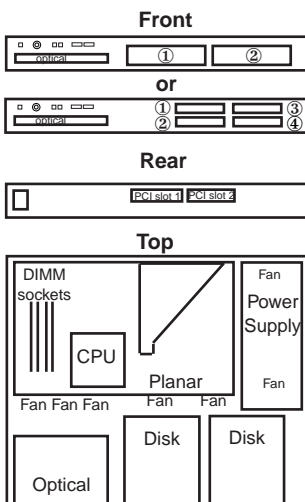
Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode / **secure remote power on / off via IPMI 2.0**

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

- 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](http://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

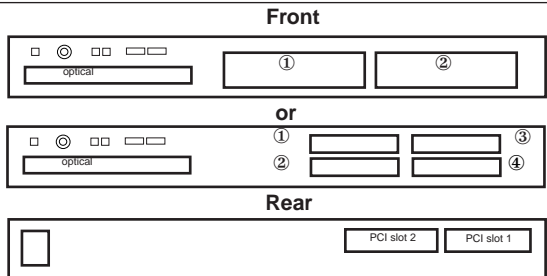
- Raven black front bezel
- H 1.75" (1U) x W 17.32" x D 22"; 43mm x 440mm x 559mm
- 24.4 to 28 lbs; 11kg to 12.7kg (minimum to max configuration)
- Configuration/Setup Utility: F1 at startup
- Network Boot: F12 at startup
- Operator Information Panel in front
- Ships with Diagnostics CD, ServerGuide 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 capacity<sup>13</sup> (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 WARRANTY<sup>3</sup>**

- 1 year parts and labor standard 4190 MTM
- 3 year parts and labor standard 4194 MTM
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, NBD avg response (ServicePac part num 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>

IBM® Machine Type	Machine model	Processor / Speed / Core	L3 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr <sup>3</sup>	Available date
4251/4252 C2x	Xeon® X3430	2.4GHz/4C	8MB	1333	2 x 1GB	SATA	2 simple-swap	1U <sup>4</sup> 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	2x3	Dual Gb	3yr	Nov 2009
4252 E4x	Xeon X3450	2.67GHz/4C	8MB	1333	2 x 1GB	SAS/SATA	2 hot-swap	1U rack	2x3	Dual Gb	3yr	Nov 2009
4251/4252 A2x	Pentium G6950	2.80GHz/2C	3MB	1333	1 x 1GB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Nov 2010
4251/4252 B2x	Core i3 540	3.06GHz/2C	4MB	1333	1 x 1GB	SATA	2 simple-swap	1U rack	2x3	Dual Gb	1/3yr	Nov 2010
Positioning	<i>Efficient and dense 1U, single-socket, rack-optimized server for web and network infrastructure</i>											
Processor	One Intel® processor at up to 3.06GHz with 1333MHz FSB and up to 8MB L3 / up to 4 Core / Xeon and Core with Intel Turbo Boost and Hyper-Threading / all Optimized for Extended Memory 64 Technology (EM64T)											
L3 cache	8MB std on Xeon / 4MB std on Core / 3MB std on Pentium											
Implementation	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	1 or 2GB std / 32GB <sup>13</sup> max** / six 240-pin gold-plated DIMM sockets / two socket used / <b>PC3-10600 1333MHz ECC DDR3-SDRAM / All Error Checking and Correcting (ECC)</b>											
SAS/SATA controller	<b>LSI Logic® 1064e</b> / daughter card / SAS or SATA drives / four-port / PCI-Express / <b>RAID 0,1,1E</b> / hot-swap models upgradeable to <b>RAID 5</b> 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	<b>EIA 22" Rack (1U<sup>4</sup>)</b> / rack-mount only											
Chipset	<b>Intel 3420 chipset</b> / 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	Optional / None standard											
Ports	<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 / <b>Remote Presence</b> via IBM Virtual Media Key											
Graphics controller	SVGA / Matrox® G200eV integrated in IMM on systemboard / 16MB 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	<b>ServerGuide™</b> (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 39M7626
- 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 Multiburner 46M0902
- IBM Virtual Media Key for Remote Presence 46C7527

Other options at [ibm.com/products/us](http://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 capacity<sup>13</sup> (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 WARRANTY<sup>3</sup>**

- 1 year parts and labor standard 4251 MTM
- 3 year parts and labor standard 4252 MTM
- **International Warranty Service<sup>3</sup>**
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 9x5, NBD avg response** (ServicePac part num 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/wamomxeu.pdf>**
- **24x7<sup>14</sup> toll-free support for warranty**



IBM® Machine Type	Machine model	Processor / Speed / Core	L2 cache	FSB MHz	Memory	Disk controller	Disk bays	Mechanical	Slots x bays	Ethernet	Ltd warr <sup>3</sup>	Available date
4192/4193	32Y	Xeon® 3065 2.33GHz/DC	4MB	1333	2 x 512MB	SATA	2 simple-swap	1U <sup>4</sup> rack	2x3	Dual GB	1/3yr	Jan 2008
4192/4193	42Y	Xeon 3075 2.66GHz/DC	4MB	1333	2 x 512MB	SATA	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	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 / 8GB<sup>13</sup> max / four 184-pin gold-plated DIMM sockets / two sockets used / PC2-5300 667MHz ECC DDR2-SDRAM / All Error Checking and Correcting (ECC) / DIMMs and ECC memory controller / industry std / unbuffered**

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

Disk None standard

Mechanical Architecture / chipsets **EIA 22" Rack (1U<sup>4</sup>)** / 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 Ports **48X-32X-48X-16X® 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**

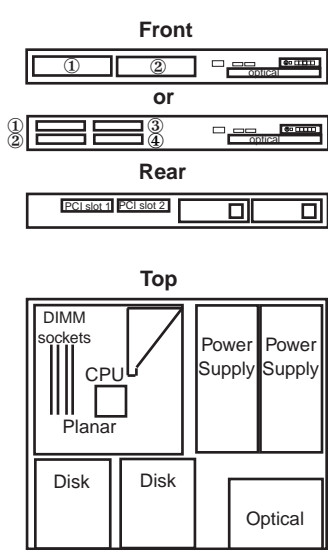
Software **ServerGuide™** (CD-ROM installation and configuration utilities), IBM Director™ and others

512MB PC2-5300 ECC DDR2	41Y2726
2GB(2x1GB) PC2-5300 ECC DDR2	41Y2729
4GB(2x2GB) PC2-5300 ECC DDR2	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
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
IBM Simple-Swap SATA RAID Kit	43V7471

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



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

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

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

- Raven black front bezel
- H 1.75" (1U) x W 17.32" x D 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 capacity<sup>13</sup> (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

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

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

- 1 year parts and labor standard 4192 MTM
- 3 year parts and labor standard 4193 MTM
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, NBD avg response (ServicePac part num 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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 / 32GB<sup>13</sup> 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 (5U<sup>4</sup>) via optional kit 39Y8382

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

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

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

**CD-ROM / diskette** 48X<sup>6</sup> CD-ROM / IDE / 1.6" HH; *Diskette*: USB only

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

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

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

**Systems mgmt** IBM Integrated Baseboard Management Controller(BMC) / IPMI 2.0 H8S2166<sup>7</sup> / 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

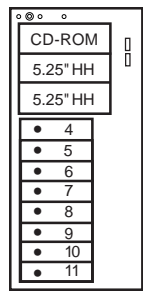
**Software** ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director, others

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



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

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

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

**Hot-Swap models:** Max internal disk capacity: 2.4TB<sup>2</sup> with eight 300GB 10K SAS or 4.0TB<sup>2</sup> with eight 500GB SATA hot-swap HDDs

**Simple-Swap models:** Max internal disk capacity: 1.0TB<sup>2</sup> with four 250GB SATA non-hot-swap HDDs

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

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

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 / 32GB<sup>13</sup> 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**

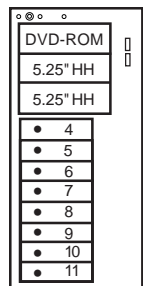
SAS/SATA controller MTs 7973/4: native SATA / on planar / PCI-Express / HostRAID 0 & 1 / MTs 7975/6: ServeRAID 8k-I std / **Adaptec® AIC-9580W / eight port SAS(300MB/sec) or SATA(150MB/sec) / hot-swap / on planar / PCI-Express / RAID 0, 1 & 10**  
 SAS connectors Dual channel controller wired to hot-swap 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 (5U<sup>4</sup>) 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 **16X<sup>6</sup> 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: 2.4TB<sup>2</sup> with eight 300GB 10K SAS or 6.0TB<sup>2</sup> with eight 750GB SATA hot-swap HDDs  
**Simple-Swap models:** Max internal disk capacity: 3.0TB<sup>2</sup> 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

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

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

IBM® Type - model	Qty x Processor/ 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/E 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 (5U<sup>4</sup>) via CTO**  
**Intel 5520 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 Graphics **16X<sup>6</sup> DVD-ROM / SATA / USB diskette only**  
**SVGA: two USB (2.0) / Rear: four USB (2.0), serial (9-pin), graphics (DB-15), three RJ-45 (2 enet, 1 sys mgmt) / Front / 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**

Keyboard / mouse **Optional in EMEA and AG / USB only**

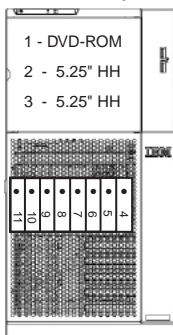
Power supply(s) **Std/Max: one 670 watt / fixed / rear access / auto restart**

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	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
IBM IMM Remote Presence Hardware Key	46C7527
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
160GB 7200-rpm SATA SS HDD	39M4504
250GB 7200-rpm SATA SS HDD	39M4508

**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:  
 2.4TB<sup>2</sup> with 8 300GB SFF SAS hot-swap HDDs  
 4.0TB<sup>2</sup> with 4 1TB SATA hot-swap HDDs  
 3.0TB<sup>2</sup> with 4 750GB SATA simple-swap HDDs

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

- 1yr / 3yr parts and labor 7836/7837 MTM
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, M-F coverage excluding holidays, nbd response time<sup>7</sup>
- 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)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup> (eligible locations only<sup>7</sup>)

See footnotes for important warranty information

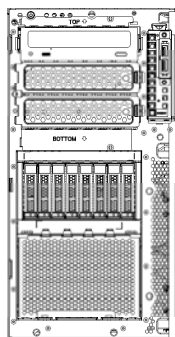
• = Hot-swap  
 \* = 8GB dimms planned availability: June 2009

IBM® Type - model	Qty x Processor/ Core	L3 cache	Memory	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date	
7379-22x	1 x Xeon™ E5503 2.0GHz/2C	4MB	1x2GB	Open	SATA	6x7 (4 SS 3.5" std)	1 x 670W	2 x Gb	March 2010
7379-24x	1 x Xeon E5503 2.0GHz/2C	4MB	1x2GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2010
7379-32x	1 x Xeon E5506 2.13GHz/4C	4MB	1x2GB	Open	SATA	6x7 (4 SS 3.5" std)	1 x 670W	2 x Gb	March 2010
7379-34x	1 x Xeon E5506 2.13GHz/4C	4MB	1x2GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2010
7379-42x	1 x Xeon E5507 2.26GHz/4C	4MB	1x2GB	Open	SAS/SATA	6x7 (4 HS 2.5" std)	1 x 670W	2 x Gb	March 2010
7379-52x	1 x Xeon E5620 2.4GHz/4C	12MB	1x4GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2010
7379-54x	1 x Xeon E5620 2.4GHz/4C	12MB	1x4GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	March 2010
7379-62x	1 x Xeon E5630 2.53GHz/4C	12MB	2x4GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 670W	2 x Gb	March 2010
7379-72x	1 x Xeon E5640 2.66GHz/4C	12MB	2x4GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 670W	2 x Gb	March 2010
7379-E1x	1 x Xeon E5503 2.0GHz/2C	4MB	3x2GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	April 2010
7379-E2x	1 x Xeon E5506 2.13GHz/4C	4MB	3x4GB	Open	SAS/SATA	6x11 (8 HS 3.5" std)	1 x 670W	2 x Gb	April 2010
7379-E3x	1 x Xeon E5620 2.4GHz/4C	12MB	3x4GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	2 x 920W HS	2 x Gb	April 2010
7379-74x	1 x Xeon E5640 2.66GHz/4C	12MB	3x4GB	Open	SAS/SATA	6x19 (16 HS 2.5" std)	1 x 920W HS	2 x Gb	July 2010

Positioning Processor(s)	<b>Flexible configuration capabilities and outstanding performance that drives affordable business growth Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 2.66GHz with up to 12MB L3 / up to 4 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>
L3 cache	4 or 12MB std and max / at processor speed
SMP Implementation	<b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, sixteen DIMM slots, five PCI-E slots, one PCI slot, and integrated SATA, ethernet and graphics controllers
Memory	2, 4 or 8GB std / <b>64GB</b> max per processor(using 8GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring
Disk Controller	Integrated SATA controller in ICH10 / 22x, 32x / RAID optional IBM ServeRAID BR10iL SAS/SATA controller / 24x, 34x, 42x, 52x, E1x, E2x / on riser card / PCI-Express / supports RAID-0/1 / IBM ServeRAID M1015 SAS/SATA controller / 54x, 62x, 72x, E3x, 74x / on riser card / PCI-Express / supports RAID-0/1 /
Disk bays	Either <b>Eight 2.5-inch SFF SAS</b> hot swap disk bays or <b>Four 3.5-inch SAS/SATA</b> simple/hot swap disk bays std / Sixteen 2.5" SFF SAS hot swap disk bays or Eight 3.5-inch SAS/SATA simple/hot swap disk bays via CTO
Mechanical Architecture/Chipset	<b>Tower</b> / conversion to EIA 26" Rack (5U <sup>4</sup> ) via option 69Y0893 <b>Intel 5520 Chipset</b> / 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 / optional to add two 64-bit PCI-X or one PCI-Express x8 slots
Ethernet	<b>Two Gigabit Ethernet ports</b> / Broadcom® 5716 / two full gigabit ethernet MAC and PHY layer functions / integrated /PCI-Express / full duplex / Wake on LAN® / Serial over LAN / PXE 2.0 / Failover, adapter fault tolerance / Load balancing
Optical / diskette Front & Rear ports Graphics	16X <sup>6</sup> 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	<b>Integrated Management Module (IMM)</b> / 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	On-board diagnostics via preboot DSA Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Publications	<b>Installation Guide and Documentation CD</b>	Xeon E5503 2.0GHz/4.8GTs/4MB L3 Cache 80W Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache 80W Xeon E5507 2.26GHz/4.8GTs/4MB L3 Cache 80W Xeon E5620 2.4GHz/5.86GTs/12MB L3 Cache 80W Xeon E5630 2.53GHz/5.86GTs/12MB L3 Cache 80W Xeon E5640 2.66GHz/5.86GTs/12MB L3 Cache 80W	69Y0859 69Y8867 69Y0860 69Y0851 69Y0852 69Y0853
Keyboard / mouse	Optional in EMEA and AG / USB only	1x1GB (1Rx8) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x2GB (2Rx8) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x2GB (1Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x4GB (2Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x8GB (2Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x2GB (2Rx8) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x2GB (1Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM 1x4GB (2Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM	49Y1432 49Y1433 49Y1434 49Y1435 49Y1436 49Y1392 49Y1393 49Y1394
Power supply(s)	<i>Some:</i> std/max: one/one 670 watt / fixed / <i>Some:</i> std/max: one/two 920 watt / hot swap / All: rear access / auto restart / not upgradeable from fixed to hot swap	IBM IMM Remote Presence Hardware Key IBM ServeRAID-M1015 SAS/SATA Controller IBM ServeRAID-M5015 SAS/SATA Controller IBM ServeRAID-MR10M SAS/SATA Controller	46C7527 46M0831 46M0829 44E8825

**Tower (SFF SAS shown)**



- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- ACPI 2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Tower: H 17.3" x W 8.6" x D 30.2"
- 59.7 to 83.4 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
- \*\*optional to add 2 - PCI-X or 1 PCI-E x8 slots via extender card

Max std internal disk capacity:  
8.0TB<sup>2</sup> with 16 - 500GB SFF SAS hot-swap HDDs  
4.0TB<sup>2</sup> with 8 - 500GB SFF SAS hot-swap HDDs  
8.0TB<sup>2</sup> with 4 - 2TB SATA hot-swap HDDs  
8.0TB<sup>2</sup> with 4 - 2TB SATA simple-swap HDDs

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

- **3yr parts and labor 7379 MTM**
- **International Warranty Service<sup>3</sup>**
- **On site, 8 am - 5 pm, M- F coverage excluding holidays, nbd response time<sup>7</sup>**
- **3 year on site warranty service upgrade options for 7379 MTM:**  
9 hr coverage, M-F excluding holidays, 4 hr avg response (ServicePac part number 84Y2268)  
**24 hr x 7 day coverage, 4 hour average response** (ServicePac part number 84Y2269)
- **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup> (eligible locations only<sup>7</sup>)**

IBM® Type - model	Qty x Processor/ Core	L3 cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date	
7379-A2x	1 x Xeon™ E5603	1.60GHz/4C	4MB	1x2GB	Open	SATA	6x7 (4 SS 3.5" std)	1 x 670W	2 x Gb	March 2011
7379-A4x	1 x Xeon E5603	1.60GHz/4C	4MB	1x2GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2011
7379-B2x	1 x Xeon E5606	2.13GHz/4C	8MB	1x2GB	Open	SATA	6x7 (4 SS 3.5" std)	1 x 670W	2 x Gb	March 2011
7379-B4x	1 x Xeon E5606	2.13GHz/4C	8MB	1x2GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2011
7379-C2x	1 x Xeon E5607	2.26GHz/4C	8MB	1x2GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2011
7379-D2x	1 x Xeon E5645	2.4GHz/6C	12MB	1x4GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 670W	2 x Gb	March 2011
7379-F2x	1 x Xeon E5649	2.53GHz/6C	12MB	1x4GB	Open	SAS/SATA	6x19 (16 HS 2.5" std)	1 x 920W HS	2 x Gb	March 2011
7379-56x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	Open	SAS/SATA	6x7 (4 HS 3.5" std)	1 x 670W	2 x Gb	March 2011
7379-58x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	March 2011
7379-E4x	1 x Xeon E5606	2.13GHz/4C	8MB	1x2GB	Open	SATA	6x7 (4 SS 3.5" std)	1 x 920W HS	2 x Gb	March 2011
7379-E5x	1 x Xeon E5620	2.40GHz/4C	12MB	1x2GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	March 2011
7379-E6x	1 x Xeon E5620	2.40GHz/4C	12MB	1x2GB	Open	SAS/SATA	6x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	March 2011

**Positioning Processor(s)** *Flexible configuration capabilities and outstanding performance that drives affordable business growth*  
**Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 2.66GHz with up to 12MB L3 / up to 4 Core / with Intel Turbo Boost Technology and Hyper-Threading**

**L3 cache SMP Implementation** **4 or 12MB** 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, five PCI-E slots, one PCI slot, and integrated SATA, ethernet and graphics controllers

**Memory** 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

**Disk Controller** Integrated SATA controller in ICH10 / A2x, B2x, E4x / RAID optional  
 IBM ServeRAID BR10iL SAS/SATA controller / A4x, B4x, C2x, 56x / on riser card / PCI-Express / supports RAID-0/1 /  
 IBM ServeRAID M1015 SAS/SATA controller / D2x, 58x, E5x, E6x / on riser card / PCI-Express / supports RAID-0/1 /  
 IBM ServeRAID M5014 SAS/SATA controller / F2x / on riser card / PCI-Express / supports RAID-0/1/5/10/50 /

**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 /  
 Sixteen 2.5" SFF SAS hot swap disk bays or Eight 3.5-inch SAS/SATA simple/hot swap disk bays via CTO

**Mechanical Architecture/Chipset** **Tower** / conversion to EIA 26" Rack (5U<sup>4</sup>) via option 69Y0893  
**Intel 5520 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 / optional to add two 64-bit PCI-X or one PCI-Express x8 slots

**Ethernet** **Two** Gigabit Ethernet ports / Broadcom® 5716 / two full gigabit ethernet MAC and PHY layer functions /  
 integrated /PCI-Express / full duplex / Wake on LAN® / Serial over LAN / PXE 2.0 /  
 Failover, adapter fault tolerance / Load balancing

**Optical / diskette Front & Rear ports Graphics** 16X<sup>6</sup> DVD-ROM / SATA / USB diskette only  
*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

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

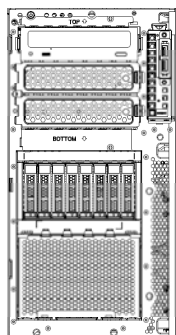
**Diagnostics Publications** On-board diagnostics via preboot DSA  
**Installation Guide and Documentation CD**

**Keyboard / mouse Power supply(s)** Optional in EMEA and AG / USB only  
*Some:* std/max: one/one 670 watt / fixed /  
*Some:* std/max: one/two 920 watt / hot swap /  
 All: rear access / auto restart / not upgradeable from fixed to hot swap

Xeon E5603 1.60GHz/4.86GTs/4MB L3 Cache 80W	81Y5942
Xeon E5606 2.13GHz/4.86GTs/8MB L3 Cache 80W	81Y5943
Xeon E5607 2.26GHz/4.86GTs/8MB L3 Cache 80W	81Y5944
Xeon E5645 2.40GHz/5.86GTs/12MB L3 Cache 80W	81Y5945
Xeon E5649 2.53GHz/5.86GTs/12MB L3 Cache 80W	81Y5946
Xeon E5620 2.40GHz/5.86GTs/12MB L3 Cache 80W	81Y5951
1x2GB (1Rx8) DDR3-1333 LP UDIMM	49Y1403
1x2GB (2Rx8) PC3L-10600E LP UDIMM	49Y1404
1x2GB (1Rx8) PC3L-10600R ECC LP RDIMM	49Y1405
1x4GB (1Rx4) PC3L-10600R ECC LP RDIMM	49Y1406
1x4GB (2Rx8) PC3L-10600R ECC LP RDIMM	49Y1407
1x2GB (2Rx8) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM	49Y1392
1x2GB (1Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM	49Y1393
1x4GB (2Rx4) PC3-10600 CL9 ECC DDR3 SDRAM RDIMM	49Y1394
IBM IMM Remote Presence Hardware Key	46C7527
IBM ServeRAID-M1015 SAS/SATA Controller	46M0831
IBM ServeRAID-M5015 SAS/SATA Controller	46M0829
IBM ServeRAID-MR10M SAS/SATA Controller	44E8825

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

**Tower (SFF SAS shown)**



- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- ACPI 2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure
- Tower: H 17.3" x W 8.6" x D 30.2"
- 59.7 to 83.4 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
- \*\*optional to add 2 - PCI-X or 1 PCI-E x8 slots via extender card

Max std internal disk capacity:  
 8.0TB<sup>2</sup> with 16 - 500GB SFF SAS hot-swap HDDs  
 4.0TB<sup>2</sup> with 8 - 500GB SFF SAS hot-swap HDDs  
 8.0TB<sup>2</sup> with 4 - 2TB SATA hot-swap HDDs  
 8.0TB<sup>2</sup> with 4 - 2TB SATA simple-swap HDDs

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

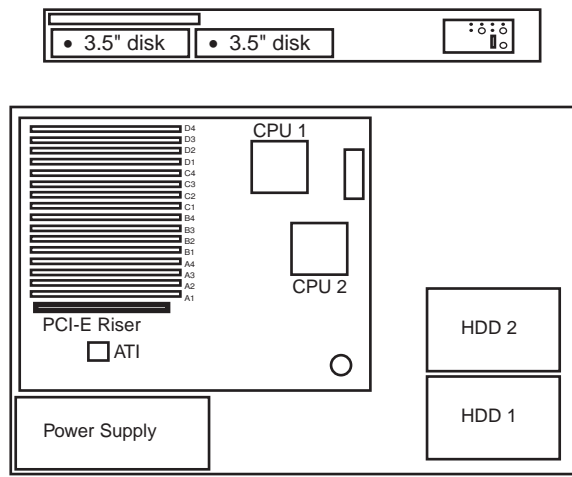
- **3yr parts and labor 7379 MTM**
- **International Warranty Service<sup>3</sup>**
- **On site, 8 am - 5 pm, M- F coverage excluding holidays, nbd response time<sup>7</sup>**
- **3 year on site warranty service upgrade options for 7379 MTM:**  
 9 hr coverage, M-F excluding holidays, 4 hr avg response (ServicePac part number 84Y2268)  
 24 hr x 7 day coverage, 4 hour average response (ServicePac part number 84Y2269)
- **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup> (eligible locations only<sup>7</sup>)**

IBM® Type-model	Qty x Processor/Core	L2 cache	Memory	Disk controller	Disk bays	Disks	Optical	Power Supply	Slots x bays	Ethernet	Limited warranty <sup>3</sup>	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

Positioning Processor	<b>1U, dual-socket server providing High Performance Computing in space-constrained environments</b> <b>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)</b>											
L2 cache	<b>12 or 6MB</b> / std and max / at processor speed											
SMP support Implementation	<b>2-way SMP</b> / 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	<b>4, 32 or 64GB</b> std / 64GB <sup>13</sup> max / 2, 8 or 16 slots used / 14, 8 or 0 slots available / <b>PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs</b> / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / <b>Fully Buffered / Error Checking and Correcting (ECC)</b> (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) / <b>Chipkill</b>											
SATA controller	<b>Integrated in ESB2-E</b> / 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	<b>Some: 500Gb or 1TB</b> ; 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	<b>Intel chipset</b> / 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	<b>EIA 19" Rack (1U<sup>4</sup>)</b> / 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 / <b>Two Intel 82563EB</b> / 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	<b>Front:</b> one USB (Vers 2.0); <b>Rear:</b> 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	<b>Intel Integrated Baseboard Management Controller(BMC)</b> / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply											
Diagnostics Software	<b>Light Guided Diagnostics</b> / 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 PC2-5300 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](http://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 WARRANTY<sup>3</sup>**

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

Max internal disk capacity:  
3.5" SATA models: 1.5TB<sup>2</sup> 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 <sup>3</sup> (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 2.5GHz<sup>1</sup> / 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 max<sup>13</sup> per processor (48GB max per dual cpu system) / *single cpu system*: two slots used, four slots available; *dual cpu system*: four slots used, eight slots available / **PC-5300 667MHz registered 240-pin DDR2-SDRAM RDIMMs** / twelve DIMM gold-connector slots on systemboard / DIMMs must be installed in matched pairs [a bank] / dual channel / two-way interleaving / **Error Checking and Correcting (ECC)** via 16-bit Checksum / **Xcelerated Memory Technology™ / Chipkill™** on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing

**SATA disk controller** **Integrated SATA II controller** / provided by HT1000 South Bridge / two port / optional SAS / optional RAID  
**SATA controller/cable** Two connectors on planar / two 1-drop cables / one 1-drop IDE cable (for optical drive)  
**Disk - capacity** 80GB / 7200 rpm / 9.0ms seek  
**Disk - bays** Two 3.5" fixed / SATA connectors / filler panels in each disk bay / supports 15k drives  
**Mechanical** **EIA 19" Rack (1U<sup>4</sup>)** / 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** Power-on and administrator passwords / unattended boot / selectable boot  
**Systems mgmt** **IBM Integrated Baseboard Management Controller(BMC)** / H82166 / IPMI 2.0

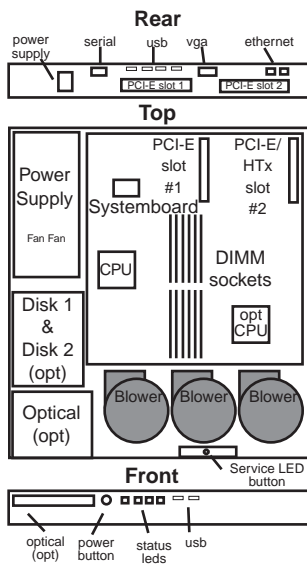
**Diagnostics** Diagnostic LEDs for fans, memory DIMMs and processors / PFA / Light Path Diagnostics not supported

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

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

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

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



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 capacity<sup>13</sup>:  
 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 WARRANTY<sup>3</sup>**

- ⇨ 1 year parts and labor
- ⇨ International Warranty Service<sup>3</sup>
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇨ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 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](http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf)
- ⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>5</sup>



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

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

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

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

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

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

Disk - bays Eight hot-swap SAS/SATA bays

Mechanical Tower / conversion to EIA 26" Rack (5U<sup>4</sup>) via optional kit 39Y8382

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

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

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

DVD-ROM / diskette 16X<sup>6</sup> 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

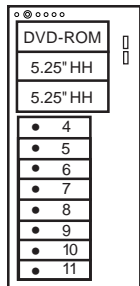
Systems mgmt	<b>IBM Integrated Baseboard Management Controller(BMC)</b> / IPMI 2.0 H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supp / supports opt. Remote Supervisor Adapter II Slimline with 140-pin connector on planar for continuous power (no ext pwr reqd)	Xeon 5050 3.0GHz/667MHz/4MB L2 Cache Proc Upg	25R8926
		Xeon 5060 3.2GHz/1066MHz/4MB L2 Cache Proc Upg	25R8912
		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

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

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

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

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

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

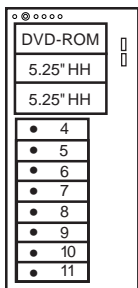
IBM® Type-model	Qty x Processor	L2 Core cache	Memory	Disk	Disk controller	Mechanical	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7977- F2x	1 x Xeon™ E5335 2.0GHz	QC 8MB	1GB	Open	SAS/SATA	Tower	6x11 (8 HS std/max)	1 x 835W HS	2xGigabit	Feb 2007
7977- G2x	1x Xeon E5345 2.33GHz	QC 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- 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

Positioning Processor	<i>Universal server; two-way server using the Xeon processor to provide power and performance at an affordable price</i> Up to 1 x Intel® Xeon Processor up to 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 Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Intel LGA771 sockets, twelve memory gold-connector DIMM slots, three PCI-E slots, two PCI-X slots, one PCI slot, integrated SAS, ethernet and graphics controllers									
Memory	1GB std / 48GB <sup>13</sup> 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 Slots (see below)	Tower / conversion to EIA 26" Rack (5U <sup>4</sup> ) via optional kit 39Y8382 Three PCI-Express, two PCI-X 64-bit/133MHz and one PCI 32-bit/33MHz slot									
Chipset	Intel 5000P chipset / Intel Memory Controller Hub (MCH) provides two PCI-Express x8 slots / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 slot with x4 Links, two 64-bit/100MHz PCI-X slots, one 32-bit/33MHz PCI slot, ATI video, Dual Gigabit ethernet, IDE, USB, SMBus, LPC bus to NS PC8374L for Super I/O									
Ethernet controller	Dual 10/100/1000 gigabit / Broadcom® BCM 5721 / on planar / PCI-Express 64-bit 100MHz / full duplex / Wake on LAN® / IPMI (2.0)									
DVD-ROM / diskette	16X <sup>6</sup> 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 read)									
Diagnosics	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](http://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:  
2.4TB<sup>2</sup> with eight 300GB 10K SAS or  
6.0TB<sup>2</sup> with eight 750GB SATA hot-swap HDDs

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

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

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) *Ultimate balance of high performance, high availability, expansion capability and ease of management in a stable, long-life platform*  
**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 **2-way SMP** / up to two Xeon Processors (same speed/cache size)  
 Implementation 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<sup>4</sup>) via CTO  
**Intel 5520 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 **16X<sup>6</sup> DVD-ROM** / SATA / USB diskette only  
*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 / Remote Presence, blue screen capture via IBM Virtual Media Key std  
 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**  
 Keyboard / mouse Optional in EMEA and AG / USB only

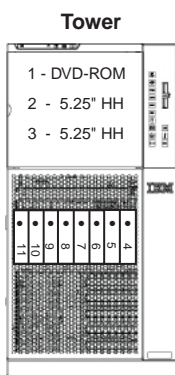
Power supply(s) *Std/Max:* one/two 920 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Cooling **Calibrated Vectored 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	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](http://ibm.com/products/us)



- ❖ 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:  
 2.4TB<sup>2</sup> with eight 300GB SAS hot-swap HDDs

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

- ❖ **3 year parts and labor**
- ❖ **International Warranty Service<sup>3</sup>**
- ❖ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ❖ **3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>**
- ❖ **9 hour coverage, Mon-Fri excluding holidays, 4 hour avg response** (ServicePac® part num 68Y5547)
- ❖ **24/7 day coverage, 4 hour avg response** (ServicePac part number 68Y5548)
- ❖ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

See footnotes for important warranty information

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

IBM® Type - model	Qty x Processor/ Core	L3 cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7380-32x	1 x Xeon™ E5506 2.13GHz/4C	4MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2010
7380-42x	1 x Xeon E5620 2.4GHz/4C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2010
7380-52x	1 x Xeon E5630 2.53GHz/4C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2010
7380-62x	1 x Xeon E5640 2.66GHz/4C	12MB	2x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2010
7380-72x	1 x Xeon X5650 2.66GHz/6C	12MB	2x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2010
7380-82x	1 x Xeon X5670 2.93GHz/6C	12MB	2x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2010
7380-92x	1 x Xeon X5680 3.33GHz/6C	12MB	2x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Apr 2010
7380-E1x	1 x Xeon E5620 2.4GHz/4C	12MB	3x4GB	Open	SAS/SATA	7x11 (8 HS 3.5" std)	1 x 920W HS	2 x Gb	Apr 2010
7380-E2x	2 x Xeon E5630 2.53GHz/4C	12MB	6x4GB	Open	SAS/SATA	7x11 (8 HS 3.5" std)	2 x 920W HS	2 x Gb	Apr 2010
7380-E3x	1 x Xeon X5650 2.66GHz/6C	12MB	3x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	2 x 920W HS	2 x Gb	Apr 2010
7380-E4x	1 x Xeon E5620 2.4GHz/4C	12MB	3x2GB	Open	SAS/SATA	7x11 (8 HS 3.5" std)	2 x 920W HS	2 x Gb	June 2010
7380-94x	1 x Xeon X5680 3.33GHz/6C	12MB	2x4GB	Open	SAS/SATA	7x19 (16 HS 2.5" std)	1 x 920W HS	2 x Gb	July 2010

**Positioning Processor(s)** *Ultimate balance of high performance, high availability, expansion capability and ease of management in a stable, long-life platform*  
**Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect (QPI) technology at up to 3.33GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading**

**L3 cache SMP Implementation** **4 or 12MB** 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, six PCI-E slots, one PCI slot, and integrated SAS/SATA, ethernet and graphics controllers

**Memory** **Up to 24GB** std / **96GB** max per processor (using 16GB 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 M1015** SAS/SATA controller / 32x, 42x, 52x, E1x / on riser card / PCI-Express / supports **RAID-0/1** / **IBM ServeRAID M5014** SAS/SATA controller / 62x, E2x, E3x, E4x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50** / **IBM ServeRAID M5015** with battery / 72x, 82x, 92x, 94x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50**

**Disk bays hot swap disk Mechanical** **Up to sixteen 2.5-inch Small Form Factor (SFF)** hot swap disk bays std / up to 24 max via CTO or upgrade options / eight 3.5" HDD bays std on E1x, E2x, E4x or via CTO / supports SAS & SATA HS disks  
**Tower** / conversion to EIA 26" Rack (5U<sup>4</sup>) via option 69Y0893

**Architecture/Chipset** **Intel 5520 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** **16X<sup>6</sup> DVD-ROM**, SATA std on most / DVD multiburner, SATA std on E4x / USB diskette only  
*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 / Remote Presence, blue screen capture 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 Keyboard / mouse** **Installation Guide and Documentation CD**  
 Optional in EMEA and AG / USB only

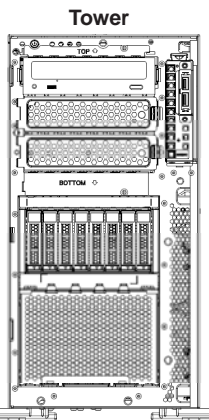
**Power supply(s)** *Std/Max:* one/two 920 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

**Cooling** **Calibrated Vectored 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	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
146GB 15K SAS SFF slim-HS 2.5" (SFF tray) HDD	42D0677
146GB 10K SAS SFF slim-HS 2.5" (SFF tray) HDD	42D0632
300GB 10K SAS SFF slim-HS 2.5" (SFF tray) HDD	42D0637
500GB 7200 6Gbps NL SAS 2.5" SFF Slim-HS HDD	42D0707

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



- 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)

- 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
- 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 30.2"
- 60.4 to 85.6 pounds
- Stealth black color

Max internal disk capacity:  
 12TB<sup>2</sup> with 24 500GB SAS hot-swap HDDs  
 (optional upgrade kit required)

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
- 9 hour coverage, Mon-Fri excluding holidays, 4 hour avg response (ServicePac® part num 21P2077)
- 24/7 day coverage, 4 hour avg response (ServicePac part number 21P2078)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type - model	Qty x Processor/ Core	L3 cache	Memory	Disk	Disk controller	Slots x bays (hot-swap bays)	Power supply	Ethernet	Available date
7380-B2x	1 x Xeon™ E5606 2.13GHz/4C	8MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-D2x	1 x Xeon E5645 2.4GHz/6C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-F2x	1 x Xeon E5649 2.53GHz/6C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-G2x	1 x Xeon X5675 3.06GHz/6C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-H2x	1 x Xeon X5690 3.46GHz/6C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-44x	1 x Xeon E5620 2.40GHz/4C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-74x	1 x Xeon X5650 2.66GHz/6C	12MB	1x4GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-E5x	1 x Xeon E5607 2.26GHz/4C	12MB	3x2GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-E6x	1 x Xeon E5645 2.40GHz/6C	12MB	3x2GB	Open	SAS/SATA	7x11 (8 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011
7380-E7x	1 x Xeon E5645 2.40GHz/6C	12MB	3x2GB	Open	SAS/SATA	7x19 (16 HS 2.5" std)	1 x 920W HS	2 x Gb	Mar 2011

Positioning Processor(s) *Ultimate balance of high performance, high availability, expansion capability and ease of management in a stable, long-life platform*  
**Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 3.46GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading**  
 L3 cache **4 or 12MB** 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, six PCI-E slots, one PCI slot, and integrated SAS/SATA, ethernet and graphics controllers

Memory **4 or 6GB** std / **96GB** max per processor(using16GB 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 M1015** SAS/SATA controller / B2x, D2x, 44x, E5x, E6x, E7x / on riser card / PCI-Express / supports **RAID-0/1 / IBM ServeRAID M5014** SAS/SATA controller / F2x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50 / IBM ServeRAID M5015** with battery / G2x, H2x, 74x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50 /**

Disk bays **Up to sixteen 2.5-inch Small Form Factor (SFF)** hot swap disk bays std / up to 24 max via CTO or upgrade options / eight 3.5" HDD hot swap disk bays via CTO / supports SAS & SATA HS disks  
 Mechanical **Tower** / conversion to EIA 26" Rack (5U\*) via option 69Y0893

Architecture/Chipset **Intel 5520 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 **16X<sup>6</sup> DVD-ROM**, SATA std on most / DVD multiburner, SATA std on E4x / USB diskette only  
 Front & Rear ports *Front:* two USB (2.0) / *Rear:* four USB (2.0), serial (9-pin), graphics (DB-15), three RJ-45 (2 enet, 1 sys mgmt)  
 Graphics 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 std

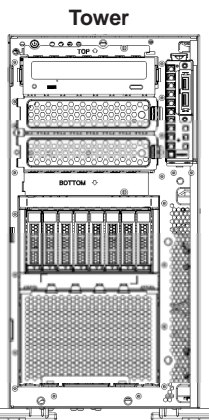
Diagnostics **Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics via preboot DSA  
 Security Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Publications **Installation Guide and Documentation CD**  
 Keyboard / mouse Optional in EMEA and AG / USB only

Power supply(s) *Std/Max:* one/two 920 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

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

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



- 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)

- 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

- Xeon E5606 2.13GHz/4.8GTs/8MB L3 Cache 81Y5943
- Xeon E5607 2.26GHz/4.8GTs/8MB L3 Cache 81Y5944
- Xeon E5645 2.4GHz/5.86GTs/12MB L3 Cache 81Y5945
- Xeon E5649 2.53GHz/5.86GTs/12MB L3 Cache 81Y5946
- Xeon X5675 3.06GHz/5.86GTs/12MB L3 Cache 81Y5949
- Xeon X5690 3.46GHz/6.46GTs/12MB L3 Cache 81Y5951
- 1x2GB (1Rx8) PC3L-10600 CL9 ECC DDR3 LP UDIMM 49Y1403
- 1x2GB (1Rx8) PC3L-10600R ECC LP RDIMM 49Y1405
- 1x4GB (1Rx4) PC3L-10600R ECC LP RDIMM 49Y1406
- 1x4GB (2Rx8) PC3L-10600R ECC LP RDIMM 49Y1407
- 1x2GB (2Rx8) PC3L-10600 CL9 ECC DDR3 LP RDIMM 49Y1392
- 1x2GB (1Rx4) PC3L-10600 CL9 ECC DDR3 LP RDIMM 49Y1393
- 1x4GB (2Rx4) PC3L-10600 CL9 ECC DDR3 LP RDIMM 49Y1394
- 1x8GB (2Rx4) PC3L-10600R LP RDIMM 49Y1397
- 1x8GB (2Rx4) PC3L-8500R LP RDIMM 49Y1398
- 1x16GB (4Rx4) PC3L-8500R LP RDIMM 49Y1400
- 920 Watt Hot-swap Power Supply Option (US) 44X0381
- 146GB 15K SAS SFF slim-HS 2.5" (SFF tray) HDD 42D0677
- 146GB 10K SAS SFF slim-HS 2.5" (SFF tray) HDD 42D0632
- 300GB 10K SAS SFF slim-HS 2.5" (SFF tray) HDD 42D0637
- 500GB 7200 6Gbps NL SAS 2.5" SFF Slim-HS HDD 42D0707

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

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
- 9 hour coverage, Mon-Fri excluding holidays, 4 hour avg response (ServicePac® part num 21P2077)
- 24/7 day coverage, 4 hour avg response (ServicePac part number 21P2078)
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

- Quick release adapter slots (no screws)
- Configuration/Setup Utility invoked by pressing F1 at startup
- ACPI 2.0-compliant
- Operator Information Panel (in front)
- Predictive failure analysis on disk options, memory, processors, VRMs, power supplies, and fans in conjunction with IBM Director can alert the system administrator of an imminent component failure

- Tower: H 17.3" x W 8.6" x D 30.2"
- 60.4 to 85.6 pounds
- Stealth black color

Max internal disk capacity:  
 12TB<sup>2</sup> with 24 500GB SAS hot-swap HDDs (optional upgrade kit required)

IBM® Type-GAV-model	Qty x Processor/Core	L2 cache Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Limited warranty <sup>3</sup>	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	

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

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

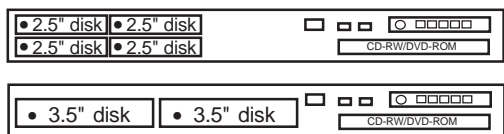
**Mechanical Chipset** **EIA 19" Rack (1U<sup>4</sup>)** / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion  
**Intel 5000X chipset** / Intel Memory Controller Hub (MCH) provides one PCI-Express x8 slot / Enterprise Southbridge(ESB-2E) provides: one PCI-Express x8 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-24X<sup>6</sup> 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

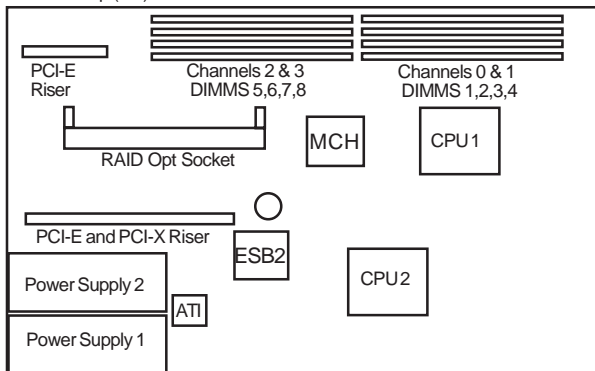
**Security Systems mgmt** Power-on password / administrator password / unattended boot / selectable boot sequence  
**IBM Integrated Baseboard Management Controller(BMC)** / IPMI 2.0 / H8S2166 / on planar / provides system and environmental monitoring such as temp, optional disks, fans, power supply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

<b>Diagnostics</b>	<b>Drop down Light Path Diagnostics</b> panel providing LED map to failing part (located on front panel)	
<b>Software</b>	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon 2.66GHz/1333MHz - 2 x 2MB L2 Cache 40K1241
<b>Keyboard / mouse</b>	None standard (because rack-based) / USB only	Xeon 3.0GHz/1333MHz - 2 x 2MB L2 Cache 40K1242
<b>Power supply</b>	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
<b>Fans</b>	<b>Calibrated Vectored Cooling™</b> Std: ten fans; Max: twelve (two fans with optional second cpu) / variable speed / hot-swap / PFA	2GB PC2-5300 FBD (2 x 1GB) 39M5785
<b>Prerequisites</b>	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
		300GB 10K-rpm SAS HS 3.5" (MM carrier) HDD 40K1041
		73.4GB 10K-rpm SAS SFF HS 2.5" (SFF tray) HDD 40K1052
		73.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD 40K1043
		146.4GB 15K-rpm SAS HS 3.5" (MM carrier) HDD 40K1044
		670 Watt Hot-swap Power Supply Option (US) 32R2815
		PCI Riser Card PCI-X Option 32R8216

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



• = Hot-swap (HS)



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: 600GB<sup>2</sup> with two 300GB SL disks  
 2.5" SAS models: 292GB<sup>2</sup> with four 73.4GB SFF disks  
 3.5" SATA models: 1TB<sup>2</sup> 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 WARRANTY<sup>3</sup>**

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

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 (1U<sup>4</sup>)** / 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 **8X-24X<sup>6</sup> 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 / 16MB 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**

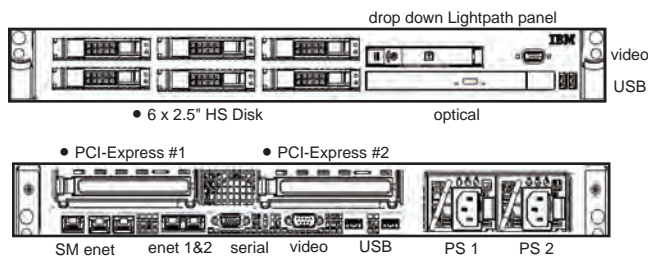
Cooling **Calibrated Vecteded Cooling™ Std/Max: six / hot-swap redundant / variable speed / PFA**

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

Xeon 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](http://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 133MHz 3.3v PCI-X via riser card

Max internal disk capacity:  
 2.5": SAS models: 1.8TB<sup>2</sup> 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 WARRANTY<sup>3</sup>**

- ↳ 3 year parts and labor
- ↳ International Warranty Service<sup>3</sup>↳On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, nbd response time<sup>7</sup>
- ↳ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup> 9 hr coverage, Mon-Fri excluding holidays, 4 hr avg response time (ServicePac<sup>®</sup> 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>
- ↳ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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 (1U<sup>4</sup>)** / 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 / 16MB 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**

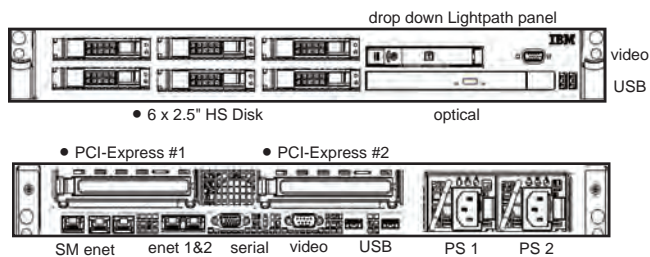
Power supply(s) **Std/Max:** one or two/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

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](http://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: 3TB<sup>2</sup> 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 WARRANTY<sup>3</sup>**

- ↳ 3 year parts and labor
- ↳ International Warranty Service<sup>3</sup> On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, nbd response time<sup>7</sup>
- ↳ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup> 9 hr coverage, Mon-Fri excluding holidays, 4 hr 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>
- ↳ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information



IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date	
7944-A2x	1 x Xeon® E5506	2.13GHz/4C	4MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-B2x	1 x Xeon E5507	2.26GHz/4C	4MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-C2x	1 x Xeon L5630	2.13GHz/4C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-D2x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-F2x	2 x Xeon E5630	2.53GHz/4C	12MB	2x4GB	2.5" Open	SAS/SATA	open	2 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-G2x	1 x Xeon E5640	2.66GHz/4C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-H2x	1 x Xeon L5640	2.26GHz/6C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-J2x	1 x Xeon X5650	2.66GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-M2x	1 x Xeon X5670	2.93GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010
7944-N2x	1 x Xeon X5680	3.33GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2010

**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 processors featuring Quick Path Interconnect(QPI) technology at up to 3.33GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading**  
**L3 cache** 4 or 12MB 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, eighteen DIMM slots, two PCI-E slots, integrated SAS, ethernet and graphics controllers

**Memory** 4, 8 or 12GB std / 86GB max per processor(using 16GB DIMMs) / **PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs** (or up to 12 DIMMs / 24GB of UDIMM) / eighteen slots on systemboard / nine DIMMs per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors

**Disk Controller** **IBM ServeRAID BR10i1 v2** SAS/SATA controller / A2x / on riser card / PCI-Express / supports **RAID-0/1/1E** / **IBM ServeRAID M1015** SAS/SATA controller / B2x, C2x, D2x, H2x, N2x / on riser card / PCI-Express / supports **RAID-0/1/10** / **IBM ServeRAID M5014** SAS/SATA controller / F2x, G2x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50** / **IBM ServeRAID M5015** SAS/SATA controller / J2x, M2x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50** / SATA controller for optional optical integrated into ICH10

**Disk bays** **Four 2.5-inch Small Form Factor (SFF)** hot swap disk bays std with option for optical drive / expandable to eight SFF hot swap disk bays without optical drive option / supports SAS, SATA or SSD SFF hot swap disks , allow mixing different drives  
**Flash Storage** USB-based slot on SAS riser card for optional Hypervisor USB key

**Mechanical Architecture/Chipset** **EIA 19" Rack (1U<sup>4</sup>)** / 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 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 / 16MB DDR2-250MHz SDRAM std/max

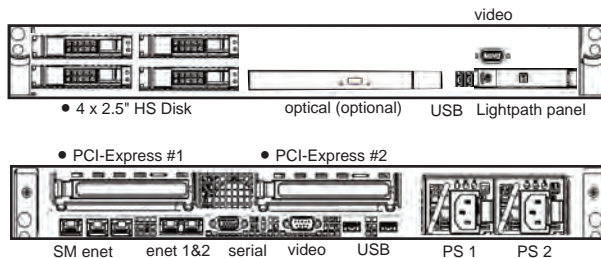
**Systems Mgmt** **Integrated Management Module (IMM)** / VSC452 / WPCT201BA0WG / integrated / provides system and environmental monitoring, event recording, alert capability / TPM 1.2 / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key  
**Light Path Diagnostics™** (LED lights indicate failing component) and on-board diagnostics  
**Security** 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 or two/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing

Xeon E5506 2.13GHz / 4C / 4MB L3 Cache w/fan	59Y3954
Xeon E5507 2.26GHz / 4C / 4MB L3 Cache w/fan	59Y4002
Xeon E5620 2.4GHz / 4C / 12MB L3 Cache w/fan	59Y4006
Xeon E5630 2.53GHz / 4C / 12MB L3 Cache w/fan	59Y4007
Xeon E5640 2.66GHz / 4C / 12MB L3 Cache w/fan	59Y4008
Xeon L5630 2.13GHz / 4C / 12MB L3 Cache w/fan	59Y4004
Xeon L5640 2.26GHz / 6C / 12MB L3 Cache w/fan	59Y4005
Xeon X5650 2.66GHz / 6C / 12MB L3 Cache w/fan	59Y4009
Xeon X5670 2.93GHz / 6C / 12MB L3 Cache w/fan	59Y4011
Xeon X5680 3.33GHz / 6C / 12MB L3 Cache w/fan	59Y4014
1x2GB (2Rx8) PC3-10600 DDR3 SDRAM RDIMM	49Y1433
1x2GB (1Rx4) PC3-10600 DDR3 SDRAM RDIMM	49Y1434
1x4GB (2Rx4) PC3-10600 DDR3 SDRAM RDIMM	49Y1435
1x8GB (2Rx4) PC3-10600 DDR3 SDRAM RDIMM	49Y1436
1x2GB (2Rx8) 1Gbit PC3-10600 DDR3-1333 LP UDIMM	44T1569
1x2GB (2Rx8) 1Gbit PC3L-10600R LP RDIMM 1.35V capable	49Y1392
1x4GB (2Rx4) 1Gbit PC3L-10600R LP RDIMM 1.35V capable	49Y1394
IBM Virtual Media key	46C7526
PCI-Express (2x8) Riser card	46M1072
+4 HDD Drive Enablement kit	59Y3951
Dual-port 1 Gb Ethernet Daughter card	46M1076
675 Watt Hot-swap Power Supply Option (US)	46M1075
Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	

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 133MHz 3.3v PCI-X via 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 1.7" x W 17.3" x D 28" (H 43mm x W 440mm x D 711mm)
- ⇨ 28 to 35.1 pounds
- ⇨ Stealth black color

Max internal disk capacity:  
 2.5": SAS models: 2TB<sup>2</sup> with four 500GB SFF disks  
 2.5": SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks

See footnotes for important warranty information

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

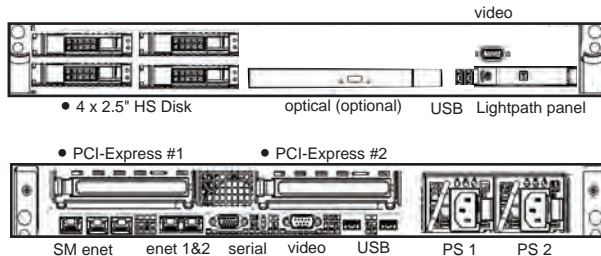
- ⇨ 3 year parts and labor
- ⇨ **International Warranty Service<sup>3</sup> - On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, nbd response time<sup>7</sup>**
- ⇨ **3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>**  
 9 hr coverage, Mon-Fri excluding holidays,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

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date
7944-E1x	1 x Xeon® E5507 2.26GHz/4C	4MB	3x2GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Apr 2010
7944-E2x	1 x Xeon E5640 2.66GHz/4C	12MB	3x4GB	2.5" Open	SAS/SATA	open	2 x 675W	4 hot-swap	2x4	2 x Gb	Apr 2010
7944-E3x	2 x Xeon X5650 2.66GHz/6C	12MB	6x4GB	2.5" Open	SAS/SATA	open	2 x 675W	4 hot-swap	2x4	2 x Gb	Apr 2010

Positioning Processor(s)	<i>Business critical compact application server to significantly reduce total cost of ownership packed with IBM innovation</i> <b>Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 3.33GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>										
L3 cache	<b>4 or 12MB</b> std and max / at processor speed										
SMP Implementation	<b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, eighteen DIMM slots, two PCI-E slots, integrated SAS, ethernet and graphics controllers										
Memory	4, 8 or 12GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> (or up to 12 DIMMs / 24GB of UDIMM) / eighteen slots on systemboard / nine DIMMs per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors										
Disk Controller	<b>IBM ServeRAID BR10i v2</b> SAS/SATA controller / A2x / on riser card / PCI-Express / supports <b>RAID-0/1/1E</b> / <b>IBM ServeRAID M1015</b> SAS/SATA controller / E1x / on riser card / PCI-Express / supports <b>RAID-0/1/10</b> / <b>IBM ServeRAID M5014</b> SAS/SATA controller / E2x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / <b>IBM ServeRAID M5015</b> SAS/SATA controller / E3x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / SATA controller for optional optical integrated into ICH10										
Disk bays	<b>Four 2.5-inch Small Form Factor (SFF)</b> hot swap disk bays std with option for optical drive / expandable to eight SFF hot swap disk bays without optical drive option / supports SAS, SATA or SSD SFF hot swap disks , allow mixing different drives										
Flash Storage	USB-based slot on SAS riser card for optional Hypervisor USB key										
Mechanical Architecture/Chipset	<b>EIA 19" Rack (1U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5520 Chipset</b> / 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 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										
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Optical / diskette	Optional optical(dvd-rom std on E1x, multiburner std on E2x and E3x) / USB only										
Front & Rear ports	<b>Front:</b> two USB (Vers 2.0), graphics (DB-15) <b>Rear:</b> 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 / 16MB DDR2-250MHz SDRAM std/max										
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / 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(std on E1x, E2x and E3x) <b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics										
Diagnostics Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode										
Publications	<b>Installation Guide and Documentation CD</b>										
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										

Xeon E5506 2.13GHz / 4C / 4MB L3 Cache w/fan	59Y3954
Xeon E5507 2.26GHz / 4C / 4MB L3 Cache w/fan	59Y4002
Xeon E5620 2.4GHz / 4C / 12MB L3 Cache w/fan	59Y4006
Xeon E5630 2.53GHz / 4C / 12MB L3 Cache w/fan	59Y4007
Xeon E5640 2.66GHz / 4C / 12MB L3 Cache w/fan	59Y4008
Xeon L5630 2.13GHz / 4C / 12MB L3 Cache w/fan	59Y4004
Xeon L5640 2.26GHz / 6C / 12MB L3 Cache w/fan	59Y4005
Xeon X5650 2.66GHz / 6C / 12MB L3 Cache w/fan	59Y4009
Xeon X5670 2.93GHz / 6C / 12MB L3 Cache w/fan	59Y4011
Xeon X5680 3.33GHz / 6C / 12MB L3 Cache w/fan	59Y4014
1x2GB (2Rx8) PC3-10600 DDR3 SDRAM RDIMM	49Y1433
1x2GB (1Rx4) PC3-10600 DDR3 SDRAM RDIMM	49Y1434
1x4GB (2Rx4) PC3-10600 DDR3 SDRAM RDIMM	49Y1435
1x8GB (2Rx4) PC3-10600 DDR3 SDRAM RDIMM	49Y1436
1x2GB (2Rx8) 1Gbit PC3-10600 DDR3-1333 LP UDIMM	44T1569
1x2GB (2Rx8) 1Gbit PC3L-10600R LP RDIMM 1.35V capable	49Y1392
1x4GB (2Rx4) 1Gbit PC3L-10600R LP RDIMM 1.35V capable	49Y1394
IBM Virtual Media key	46C7526
PCI-Express (2x8) Riser card	46M1072
+4 HDD Drive Enablement kit	59Y3951
Dual-port 1 Gb Ethernet Daughter card	46M1076
675 Watt Hot-swap Power Supply Option (US)	46M1075
Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	

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 133MHz 3.3v PCI-X via riser card

- ⇨ Quick release adapter slots (no screws)
- ⇨ Configuration/Setup Utility: F1 at startup
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- ⇨ 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 1.7" x W 17.3" x D 28" (H 43mm x W 440mm x D 711mm)
- ⇨ 28 to 35.1 pounds
- ⇨ Stealth black color

Max internal disk capacity:  
2.5": SAS models: 2TB<sup>2</sup> with four 500GB SFF disks  
2.5": SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks

See footnotes for important warranty information

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

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

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date
7944-12x	1 x Xeon®	E5603 1.60GHz/4C	4MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-22x	1 x Xeon	E5606 2.13GHz/4C	8MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-32x	1 x Xeon	E5607 2.26GHz/4C	8MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-D4x	1 x Xeon	E5620 2.40GHz/4C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-H4x	1 x Xeon	L5640 2.26GHz/6C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-52x	1 x Xeon	E5645 2.40GHz/6C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-54x	1 x Xeon	E5645 2.40GHz/6C	12MB	2x4GB 2.5" Open	SAS/SATA	open	2 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-62x	1 x Xeon	E5649 2.53GHz/6C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-J4x	1 x Xeon	X5650 2.66GHz/6C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-72x	1 x Xeon	X5675 3.06GHz/6C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-82x	1 x Xeon	X5690 3.46GHz/6C	12MB	1x4GB 2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-E4x	1 x Xeon	E5607 2.26GHz/4C	8MB	3x2GB 2.5" Open	SAS/SATA	multiburner	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-E5x	1 x Xeon	E5649 2.53GHz/6C	12MB	3x2GB 2.5" Open	SAS/SATA	multiburner	1 x 460W	4 hot-swap	2x4	2 x Gb	Mar 2011
7944-E6x	1 x Xeon	X5650 2.66GHz/6C	12MB	3x4GB 2.5" Open	SAS/SATA	multiburner	2 x 675W	4 hot-swap	2x4	2 x Gb	Mar 2011

**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 processors featuring Quick Path Interconnect(QPI) technology at up to 3.46GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading**

**L3 cache** 4 or 12MB 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, eighteen DIMM slots, two PCI-E slots, integrated SAS, ethernet and graphics controllers

**Memory** Up to 12GB std / **96GB** max per processor(using 16GB DIMMs) / **PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs** (or up to 12 DIMMS / 24GB of UDIMM) / eighteen slots on systemboard / nine DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors

**Disk Controller** **IBM ServeRAID BR10i v2** SAS/SATA controller / 12x / on riser card / PCI-Express / supports **RAID-0/1/1E / IBM ServeRAID M1015** SAS/SATA controller / 22x, 32x, D4x, E4x, E5x, E6x / on riser card / PCI-Express / supports **RAID-0/1/10 / IBM ServeRAID M5014** SAS/SATA controller / 52x, 54x, 62x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50 / IBM ServeRAID M5015** with battery / J4x, 72x, 83x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50 / SATA** controller for optional optical integrated into ICH10

**Disk bays** **Four 2.5-inch Small Form Factor (SFF)** hot swap disk bays std with option for optical drive / expandable to eight SFF hot swap disk bays without optical drive option / supports SAS, SATA or SSD SFF hot swap disks , allow mixing different drives

**Flash Storage** USB-based slot on SAS riser card for optional Hypervisor USB key

**Mechanical Architecture/Chipset** **EIA 19" Rack (1U)** / 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 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

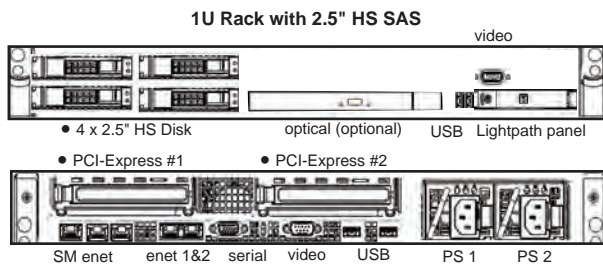
**Optical / diskette Front & Rear ports** Optional SATA optical(multiburner std on E4x, E5x, E6x) / USB only  
**Front:** two USB (Vers 2.0), graphics (DB-15) **Rear:** two USB (Vers 2.0), serial (9-pin), graphics (DB-15), two ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port

**Graphics** SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB 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(std on E1x, E2x and E3x)

**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

<b>Publications Keyboard / mouse</b>	<b>Installation Guide and Documentation CD</b> None standard (because rack-based) / USB only	Xeon E5603 1.60GHz / 4C / 4MB L3 Cache w/fan Xeon E5606 2.13GHz / 4C / 8MB L3 Cache w/fan Xeon E5607 2.26GHz / 4C / 8MB L3 Cache w/fan Xeon E5620 2.40GHz / 4C / 12MB L3 Cache w/fan Xeon L5640 2.26GHz / 6C / 12MB L3 Cache w/fan Xeon E5649 2.53GHz / 6C / 12MB L3 Cache w/fan Xeon X5650 2.66GHz / 6C / 12MB L3 Cache w/fan Xeon X5675 3.06GHz / 6C / 12MB L3 Cache w/fan Xeon X5690 3.46GHz / 6C / 12MB L3 Cache w/fan	81Y6548 81Y6549 81Y6550 59Y4006 59Y4005 81Y6552 59Y4009 81Y6554 81Y6555
<b>Power supply(s)</b>	<i>Std/Max:</i> one or two/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	1x8GB (2Rx4) PC3-10600 DDR3 SDRAM RDIMM 1x8GB (2Rx4) PC3-10600 DDR3 SDRAM RDIMM 1x2GB (2Rx8) 1Gbit PC3-10600 DDR3-1333 LP UDIMM 1x2GB (2Rx8) 1Gbit PC3L-10600R LP RDIMM 1.35V capable 1x4GB (2Rx4) 1Gbit PC3L-10600R LP RDIMM 1.35V capable IBM Virtual Media key PCI-Express (2x8) Riser card +4 HDD Drive Enablement kit 675 Watt Hot-swap Power Supply Option (US)	49Y1435 49Y1436 44T1569 49Y1392 49Y1394 46C7526 46M1072 59Y3951 46M1075



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

- 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 1.7" x W 17.3" x D 28" (H 43mm x W 440mm x D 711mm)
- 28 to 35.1 pounds
- Stealth black color

Max internal disk capacity:  
 2.5": SAS models: 2TB<sup>2</sup> with four 500GB SFF disks  
 2.5": SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks

See footnotes for important warranty information

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

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

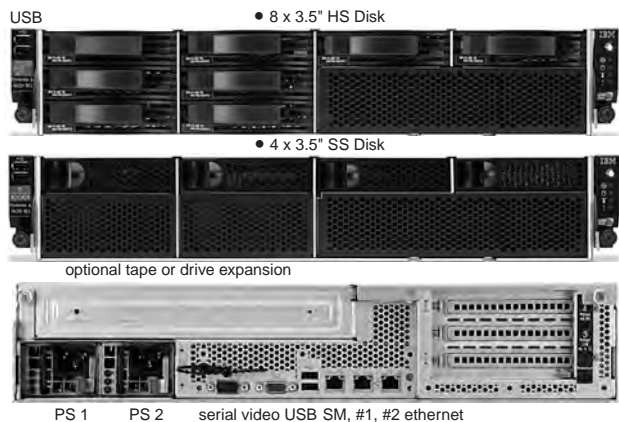
- 3 year parts and labor
- International Warranty Service<sup>3</sup> - On site, 8am - 5pm, Mon - Fri coverage excluding holidays, nbd response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr avg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

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date	
7376-22x	1 x Xeon® E5506	2.13GHz/4C	4MB	1x2GB	3.5" Open	SATA	open	1 x 675W	4 simple-swap	2x5	2 x Gb	Jun 2010
7376-32x	1 x Xeon E5507	2.26GHz/4C	4MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010
7376-42x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010
7376-52x	1 x Xeon E5630	2.53GHz/4C	12MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010
7376-62x	1 x Xeon X5650	2.66GHz/6C	12MB	3x4GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010
7376-E1x	1 x Xeon E5506	2.13GHz/4C	4MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010
7376-E2x	1 x Xeon E5620	2.40GHz/4C	12MB	3x2GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010
7376-E3x	1 x Xeon X5650	2.66GHz/6C	12MB	3x4GB	3.5" Open	SAS/SATA	open	2 x 675W	8 hot-swap	2x9	2 x Gb	Jun 2010

Processor(s)	<b>Up to two Next Generation Intel® Xeon EP processors featuring Quick Path Interconnect(QPI) technology at up to 2.66GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>	
L3 cache	4 or 12MB / on-die / shared	
SMP	2-way SMP / up to two Xeon Processors (same speed/cache size)	
Implementation	Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, two PCI-E slots, SAS adapter slot, integrated SATA, ethernet and graphics controllers	
Memory	2, 4 or 12GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / twelve slots on systemboard / six DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for X5600 series processors	
Disk Controller	Integrated SATA controller / 22x / provided by ICH10R / 300MB/s / supports SW RAID 0/1 / simple-swap <b>IBM ServeRAID M1015</b> SAS/SATA controller / 32x, 42x, E1x / on riser card / PCI-Express / supports <b>RAID-0/1/10</b> / hot-swap <b>IBM ServeRAID M5014</b> SAS/SATA controller / 52x, E2x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / hot-swap <b>IBM ServeRAID M5015</b> SAS/SATA controller / 62x, E3x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / hot-swap SATA controller for optional optical integrated into ICH10R	
Disk bays	<b>Four 3.5-inch simple-swap or eight 3.5-inch hot-swap disk bays</b> std / supports SAS and SATA HDD	
Flash Storage	USB-based slot on SAS riser card for optional Hypervisor USB key	
Tape backup	Optional internal and external / 3.5" / USB or SATA	
Mechanical	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion	
Architecture/Chipset	<b>Intel 5500 Chipset</b> / Intel IO Hub provides PCI-Express slots, links to Intel 82575 and interface to ICH10R South Bridge / ICH10R provides: USB, SATA and LPC bus to VSC452 for video and limited Super I/O	
BUS slots	(See below) Two second-generation PCI-Express x8 slots / via riser	
Ethernet	<b>Two Gigabit Ethernet ports</b> / Intel 82575 / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / Wake on LAN® / Failover / PXE 2.0 / Load balancing	
Optical / diskette	Optional optical / USB only	
Front & Rear ports	<b>Front:</b> two USB (Vers 2.0) <b>Rear:</b> 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 / 16MB DDR2-250MHz SDRAM std/max	
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / VSC452 / integrated / provides system and environmental monitoring, event recording, alert capability / ASR / SOL / IPMI 2.0 / SMASH /upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key	
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics	
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
Cooling	<b>Calibrated Vectored Cooling™</b> / up to four fan modules / redundant / variable speed / PFA	
Publications	<b>Installation Guide and Documentation CD</b>	
Keyboard / mouse	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	
Prerequisites	Monitor, keyboard, mouse, disk, rack, OS	

Xeon E5506 2.13GHz / 4C / 4MB L3 Cache	69Y1217
Xeon E5507 2.26GHz / 4C / 4MB L3 Cache	69Y1356
Xeon E5620 2.4GHz / 4C / 12MB L3 Cache	69Y1225
Xeon E5630 2.53GHz / 4C / 12MB L3 Cache	69Y1357
Xeon X5650 2.66GHz / 6C / 12MB L3 Cache	69Y1229
1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1433
1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1434
1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1435
1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1436
ServeRAID M5015 SAS/SATA controller	46M0829
ServeRAID M5014 SAS/SATA controller	46M0916
ServeRAID M5000 series advance feature key	46M0930
ServeRAID M5000 series battery kit	46M0917
ServeRAID M1015 SAS/SATA controller	46M0831
ServeRAID M1015 RAID 5 upgrade key	46M0832
hIBM Virtual Media key	46C7527
IBM x3620 M3 ODD Cage Assembly	69Y0797
IBM x3620 M3 USB Tape Drive Cage Assembly	69Y0798
IBM x3620 M3 SATA Tape Drive Cage Assembly	69Y1032
IBM x3620 M3 SS-SW RAID to HS-HW RAID upgrade kit	69Y1360
675 Watt Hot-swap Power Supply Option (US)	69Y1213

**2U Rack with 3.5" HS SAS/SATA**



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

- 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, and system-error LED
- Stealth black color
- 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 3.4" x W 17.6" x D 29.5" (H 86.5mm x W 447mm x D 749.4mm)
- 36 to 50 pounds

Max internal disk capacity: 16TB<sup>2</sup> with eight 2TB disks

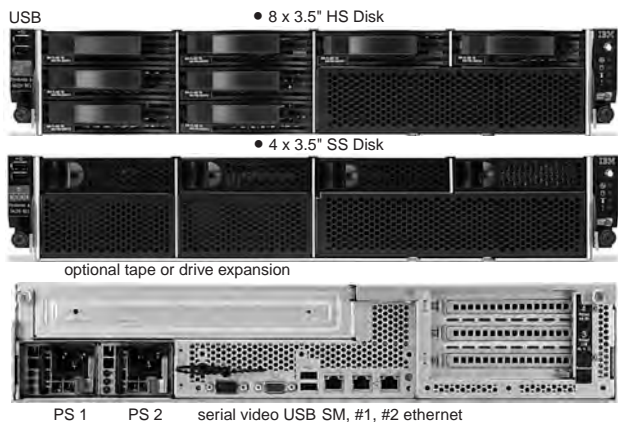
**LIMITED WARRANTY<sup>3</sup>**

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>®</sup> 88Y8328)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 88Y8329)
  - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 88Y8330)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date	
7376-A2x	1 x Xeon® E5603	1.60GHz/4C	4MB	1x2GB	3.5" Open	SATA	open	1 x 460W	4 simple-swap	2x5	2 x Gb	Mar 2011
7376-B2x	1 x Xeon E5607	2.26GHz/4C	8MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 460W	8 hot-swap	2x9	2 x Gb	Mar 2011
7376-44x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 460W	8 hot-swap	2x9	2 x Gb	Mar 2011
7376-D2x	1 x Xeon E5645	2.40GHz/6C	12MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 460W	8 hot-swap	2x9	2 x Gb	Mar 2011
7376-64x	1 x Xeon X5650	2.66GHz/6C	12MB	1x4GB	3.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Mar 2011
7376-E4x	1 x Xeon E5606	2.13GHz/4C	8MB	1x4GB	3.5" Open	SATA	open	1 x 675W	8 hot-swap	2x9	2 x Gb	Mar 2011

Processor(s)	<b>Up to two Next Generation Intel® Xeon EP processors featuring Quick Path Interconnect(QPI) technology at up to 2.66GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>	
L3 cache	4 or 12MB / on-die / shared	
SMP	2-way SMP / up to two Xeon Processors (same speed/cache size)	
Implementation	Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, two PCI-E slots, SAS adapter slot, integrated SATA, ethernet and graphics controllers	
Memory	2 or 4GB std / <b>96GB max per processor(using 16GB DIMMs) / PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / twelve slots on systemboard / six DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for X5600 series processors	
Disk Controller	Integrated SATA controller / A2x, E4x / provided by ICH10R / 300MB/s / supports SW RAID 0/1 / simple-swap <b>IBM ServeRAID M1015</b> SAS/SATA controller / B2x, 44x, E1x / on riser card / PCI-Express / supports <b>RAID-0/1/10</b> / hot-swap <b>IBM ServeRAID M5014</b> SAS/SATA controller / D2x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / hot-swap <b>IBM ServeRAID M5015</b> with battery / 64x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / hot-swap SATA controller for optional optical integrated into ICH10R	
Disk bays	<b>Four 3.5-inch simple-swap or eight 3.5-inch hot-swap disk bays</b> std / supports SAS and SATA HDD	
Flash Storage	USB-based slot on SAS riser card for optional Hypervisor USB key	
Tape backup	Optional internal and external / 3.5" / USB or SATA	
Mechanical	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion	
Architecture/Chipset	<b>Intel 5500 Chipset</b> / Intel IO Hub provides PCI-Express slots, links to Intel 82575 and interface to ICH10R South Bridge / ICH10R provides: USB, SATA and LPC bus to VSC452 for video and limited Super I/O	
BUS slots	(See below) Two second-generation PCI-Express x8 slots / via riser	
Ethernet	<b>Two Gigabit Ethernet ports</b> / Intel 82575 / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / Wake on LAN® / Failover / PXE 2.0 / Load balancing	
Optical / diskette	Optional optical / USB only	
Front & Rear ports	<b>Front:</b> two USB (Vers 2.0) <b>Rear:</b> 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 / 16MB DDR2-250MHz SDRAM std/max	
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / VSC452 / integrated / provides system and environmental monitoring, event recording, alert capability / ASR / SOL / IPMI 2.0 / SMASH /upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key	
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics	
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
Cooling	<b>Calibrated Vectored Cooling™</b> / up to four fan modules / redundant / variable speed / PFA	
Publications	<b>Installation Guide and Documentation CD</b>	Xeon E5603 1.60GHz / 4C / 4MB L3 Cache 69Y6703 Xeon E5607 2.26GHz / 4C / 8MB L3 Cache 69Y6705 Xeon E5620 2.40GHz / 4C / 12MB L3 Cache 69Y1225 Xeon E5645 2.40GHz / 6C / 12MB L3 Cache 81Y6707 Xeon X5650 2.66GHz / 6C / 12MB L3 Cache 69Y1229
Keyboard / mouse	None standard (because rack-based) / USB only	1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 49Y1433 1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 49Y1434 1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 49Y1435 1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 49Y1436
Power supply(s)	Std/Max: one/two 460 or 675W hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	ServeRAID M5015 SAS/SATA controller 46M0829 ServeRAID M5014 SAS/SATA controller 46M0916 ServeRAID M5000 series advance feature key 46M0930 ServeRAID M5000 series battery kit 46M0917 ServeRAID M1015 SAS/SATA controller 46M0831 ServeRAID M1015 RAID 5 upgrade key 46M0832 IBM Virtual Media key 46C7527 IBM x3620 M3 ODD Cage Assembly 69Y0797 IBM x3620 M3 USB Tape Drive Cage Assembly 69Y0798 IBM x3620 M3 SATA Tape Drive Cage Assembly 69Y1032 IBM x3620 M3 SS-SW RAID to HS-HW RAID upgrade kit 69Y1360 460W Redundant Power Supply Option (US) 81Y6754 675W Redundant Power Supply Option (US) 69Y1213
Prerequisites	Monitor, keyboard, mouse, disk, rack, OS	Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>

2U Rack with 3.5" HS SAS/SATA



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

- 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, and system-error LED
- Stealth black color
- 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 3.4" x W 17.6" x D 29.5" (H 86.5mm x W 447mm x D 749.4mm)
- 36 to 50 pounds

Max internal disk capacity: 16TB<sup>2</sup> with eight 2TB disks

LIMITED WARRANTY<sup>3</sup>

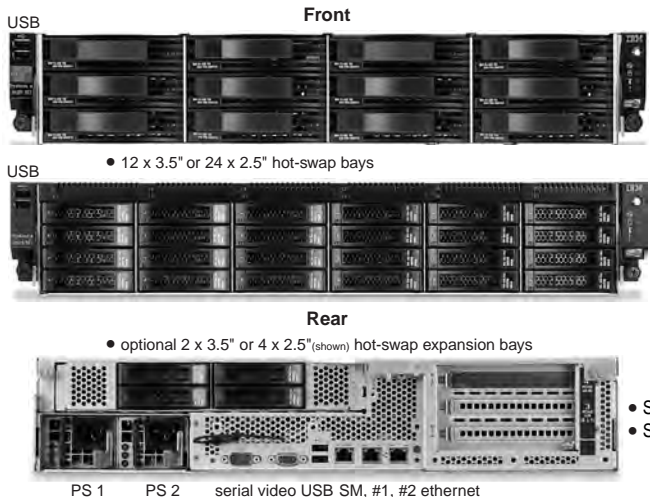
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>®</sup> 88Y8328)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 88Y8329)
  - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 88Y8330)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk / Bays	Storage Controller	Power Supply	Slots x bays	Ethernet	Available date	
7377-22x	1 x Xeon® E5506	2.13GHz/4C	4MB	1x4GB	open / 12 hot-swap 3.5"	ServeRAID M1015	1 x 675W	3x12	2 x Gb	Sep 2010
7377-32x	1 x Xeon E5507	2.26GHz/4C	4MB	1x4GB	open / 12 hot-swap 3.5"	ServeRAID M1015	1 x 675W	3x12	2 x Gb	Sep 2010
7377-42x	1 x Xeon E5630	2.53GHz/4C	12MB	1x4GB	open / 12 hot-swap 3.5"	ServeRAID M5014	1 x 675W	3x12	2 x Gb	Sep 2010
7377-52x	1 x Xeon E5640	2.66GHz/4C	12MB	1x4GB	open / 24 hot-swap 2.5"	ServeRAID M5014	1 x 675W	3x24	2 x Gb	Sep 2010
7377-62x	1 x Xeon X5650	2.66GHz/6C	12MB	3x4GB	open / 12 hot-swap 3.5"	ServeRAID M5015	1 x 675W	3x12	2 x Gb	Sep 2010
7377-72x	1 x Xeon X5670	2.93GHz/6C	12MB	3x4GB	open / 24 hot-swap 2.5"	ServeRAID M5015	1 x 675W	3x24	2 x Gb	Sep 2010
7377-E1x	2 x Xeon E5620	2.4GHz/4C	12MB	6x2GB	4x1TB / 12 hot-swap 3.5"	ServeRAID M5015	2 x 675W	3x12	2 x Gb	Nov 2010
7377-E2x	2 x Xeon E5620	2.4GHz/4C	12MB	6x4GB	6x1TB / 12 hot-swap 3.5"	ServeRAID M5015	2 x 675W	3x12	2 x Gb	Nov 2010

Processor(s)	<b>Up to two Next Generation Intel® Xeon EP processors featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>		
L3 cache	4 or 12MB / on-die / shared		
SMP Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, two PCI-E slots, SAS adapter slot, integrated SATA, ethernet and graphics controllers		
Memory	4, 12 or 20GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / twelve slots on systemboard / six DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for X5600 series processors		
Storage Controller	<b>IBM ServeRAID M1015</b> SAS/SATA controller / 22x, 32x / on riser card / PCI-E / supports <b>RAID-0/1/10</b> / hot-swap <b>IBM ServeRAID M5014</b> SAS/SATA controller / 42x, 52x / on riser card / PCI-E / supports <b>RAID-0/1/10/5/50</b> / hot-swap <b>IBM ServeRAID M5015</b> with battery / 62x, 72x, E1x, E2x / on riser card / PCI-E / supports <b>RAID-0/1/10/5/50</b> / hot-swap		
Disk bays	<b>3.5-inch: 12 std + 2 rear optional / 2.5-inch: 24 std + 4 rear optional</b> / supports SAS and SATA HDD / hot-swap		
Flash Storage	USB-based slot on SAS riser card for optional Hypervisor USB key		
Mechanical	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion		
Architecture/Chipset	<b>Intel 5500 Chipset</b> / Intel IO Hub provides PCI-Express slots, links to Intel 82575 and interface to ICH10R South Bridge / ICH10R provides: USB, SATA and LPC bus to VSC452 for video and limited Super I/O		
BUS slots	(See below) Two second-generation PCI-Express x8 slots / via riser		
Ethernet	<b>Two</b> Gigabit Ethernet ports / Intel 82575 / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / Wake on LAN® / Failover / PXE 2.0 / Load balancing		
Optical / diskette	USB only		
Front & Rear ports	<i>Front:</i> two USB (Vers 2.0) <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 / 16MB DDR2-250MHz SDRAM std/max		
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / VSC452 / integrated / provides system and environmental monitoring, event recording, alert capability / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key		
Diagnostics Security	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode		
Cooling	<b>Calibrated Vectored Cooling™</b> / up to four fan modules / redundant / variable speed / PFA		
Publications	<b>Installation Guide and Documentation CD</b>		
Keyboard / mouse	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		
Prerequisites	Monitor, keyboard, mouse, disk, rack, OS		

Xeon E5506 2.13GHz / 4C / 4MB L3 Cache	69Y1217
Xeon E5507 2.26GHz / 4C / 4MB L3 Cache	69Y1356
Xeon E5630 2.53GHz / 4C / 12MB L3 Cache	69Y1357
Xeon E5640 2.66GHz / 4C / 12MB L3 Cache	69Y1358
Xeon X5650 2.66GHz / 6C / 12MB L3 Cache	69Y1229
Xeon X5670 2.93GHz / 6C / 12MB L3 Cache	69Y1231
1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1392
1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1434
1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1435
1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1436
ServeRAID M5015 SAS/SATA controller	46M0829
ServeRAID M5014 SAS/SATA controller	46M0916
ServeRAID M5000 series advance feature key	46M0930
ServeRAID M5000 series battery kit	46M0917
ServeRAID M1015 SAS/SATA controller	46M0831
IBM Virtual Media key	46C7527
IBM x3630 M3 3.5" HS Cage Assembly, rear 2 x 3.5"	69Y1511
IBM x3630 M3 2.5" HS Cage Assembly, rear 4 x 2.5"	69Y1527
675 Watt Hot-swap Power Supply Option (US)	69Y1213

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



- 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, HDD activity, locator, and system-error
- Stealth black color
- 35.68 to 64.32 pounds
- 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 3.4" x W 17.6" x D 28.35" (H 86.5mm x W 447mm x D 720.2mm)
- Slot 2: PCI-Express x8, half length, full height
- Slot 1: PCI-Express x8, half length, full height

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

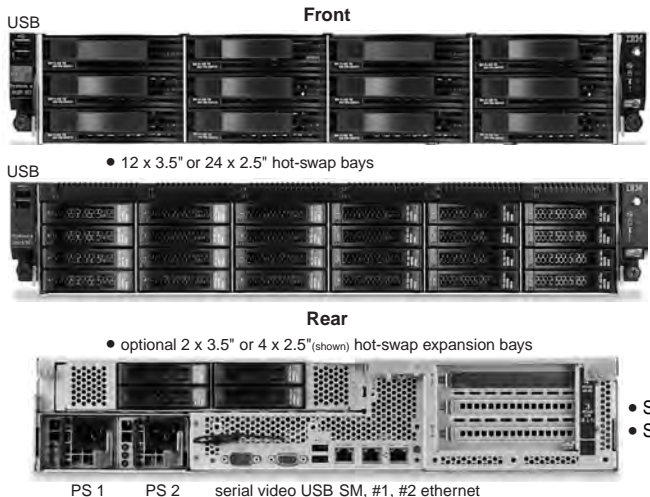
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>®</sup> 88Y8328)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 88Y8329)
  - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 88Y8330)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk / Bays	Optical	Power Supply	Slots x bays	Ethernet	Available date	
7377-A2x	1 x Xeon® E5603	1.60GHz/4C	4MB	1x4GB	open / 12 hot-swap 3.5"	open	1 x 675W	3x12	2 x Gb	Mar 2011
7377-B2x	1 x Xeon E5607	2.26GHz/4C	8MB	1x4GB	open / 12 hot-swap 3.5"	open	1 x 675W	3x12	2 x Gb	Mar 2011
7377-C2x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	open / 24 hot-swap 2.5"	open	1 x 675W	3x24	2 x Gb	Mar 2011
7377-D2x	1 x Xeon E5645	2.40GHz/6C	12MB	1x4GB	open / 12 hot-swap 3.5"	open	1 x 675W	3x12	2 x Gb	Mar 2011
7377-F2x	1 x Xeon E5649	2.53GHz/6C	12MB	1x4GB	open / 24 hot-swap 2.5"	open	1 x 675W	3x24	2 x Gb	Mar 2011
7377-64x	1 x Xeon X5650	2.66GHz/6C	12MB	1x4GB	open / 12 hot-swap 3.5"	open	1 x 675W	3x12	2 x Gb	Mar 2011
7377-G2x	1 x Xeon X5675	3.06GHz/6C	12MB	1x4GB	open / 24 hot-swap 2.5"	open	1 x 675W	3x24	2 x Gb	Mar 2011

Processor(s)	<b>Up to two Next Generation Intel® Xeon EP processors featuring Quick Path Interconnect(QPI) technology at up to 3.06GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>		
L3 cache	Up to 12MB / on-die / shared		
SMP Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) Systemboard contains two Socket B (LGA1366) sockets, twelve DIMM slots, two PCI-E slots, SAS adapter slot, integrated SATA, ethernet and graphics controllers		
Memory	4GB std / <b>96GB max per processor</b> (using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / twelve slots on systemboard / six DIMMs per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for X5600 series processors		
Storage Controller	<b>IBM ServeRAID M1015</b> SAS/SATA controller / A2x, B2x / on riser card / PCI-E / supports <b>RAID-0/1/10</b> / hot-swap <b>IBM ServeRAID M5014</b> SAS/SATA controller / C2x, D2x / on riser card / PCI-E / supports <b>RAID-0/1/10/5/50</b> / hot-swap <b>IBM ServeRAID M5015 with battery</b> / F2x, 64x, G2x / on riser card / PCI-E / supports <b>RAID-0/1/10/5/50</b> / hot-swap		
Disk bays	<b>3.5-inch: 12 std + 2 rear optional / 2.5-inch: 24 std + 4 rear optional</b> / supports SAS and SATA HDD / hot-swap		
Flash Storage	USB-based slot on SAS riser card for optional Hypervisor USB key		
Mechanical	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion		
Architecture/Chipset	<b>Intel 5500 Chipset</b> / Intel IO Hub provides PCI-Express slots, links to Intel 82575 and interface to ICH10R South Bridge / ICH10R provides: USB, SATA and LPC bus to VSC452 for video and limited Super I/O		
BUS slots	(See below) Two second-generation PCI-Express x8 slots / via riser		
Ethernet	<b>Two Gigabit Ethernet ports</b> / Intel 82575 / two full gigabit ethernet MAC and PHY layer functions / integrated / PCI-Express / full duplex / Wake on LAN® / Failover / PXE 2.0 / Load balancing		
Optical / diskette	USB only		
Front & Rear ports	<i>Front:</i> two USB (Vers 2.0) <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 / 16MB DDR2-250MHz SDRAM std/max		
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / VSC452 / integrated / provides system and environmental monitoring, event recording, alert capability / ASR / SOL / IPMI 2.0 / SMASH / upgradeable to Remote Presence, blue screen capture via optional IBM Virtual Media Key		
Diagnostics Security	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode		
Cooling	<b>Calibrated Vectored Cooling™</b> / up to four fan modules / redundant / variable speed / PFA		
Publications	<b>Installation Guide and Documentation CD</b>		
Keyboard / mouse	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		
Prerequisites	Monitor, keyboard, mouse, disk, rack, OS		

Xeon E5506 2.13GHz / 4C / 4MB L3 Cache	69Y1217
Xeon E5507 2.26GHz / 4C / 4MB L3 Cache	69Y1356
Xeon E5630 2.53GHz / 4C / 12MB L3 Cache	69Y1357
Xeon E5640 2.66GHz / 4C / 12MB L3 Cache	69Y1358
Xeon X5650 2.66GHz / 6C / 12MB L3 Cache	69Y1229
Xeon X5670 2.93GHz / 6C / 12MB L3 Cache	69Y1231
1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1392
1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1434
1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1435
1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1436
ServeRAID M5015 SAS/SATA controller	46M0829
ServeRAID M5014 SAS/SATA controller	46M0916
ServeRAID M5000 series advance feature key	46M0930
ServeRAID M5000 series battery kit	46M0917
ServeRAID M1015 SAS/SATA controller	46M0831
IBM Virtual Media key	46C7527
IBM x3630 M3 3.5" HS Cage Assembly, rear 2 x 3.5"	69Y1511
IBM x3630 M3 2.5" HS Cage Assembly, rear 4 x 2.5"	69Y1527
675 Watt Hot-swap Power Supply Option (US)	69Y1213



- 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, HDD activity, locator, and system-error
- Stealth black color
- 35.68 to 64.32 pounds
- 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 3.4" x W 17.6" x D 28.35" (H 86.5mm x W 447mm x D 720.2mm)
- Slot 2: PCI-Express x8, half length, full height
- Slot 1: PCI-Express x8, half length, full height

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>8</sup> 88Y8328)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 88Y8329)
  - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 88Y8330)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

IBM® Type-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

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

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

**Memory** 1GB std / 48GB<sup>13</sup> 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: two 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 (2U<sup>4</sup>)** / 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 Front & Rear ports** 8X-24X<sup>6</sup> 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), one SAS / no parallel port

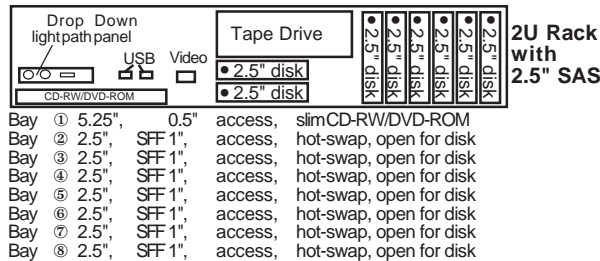
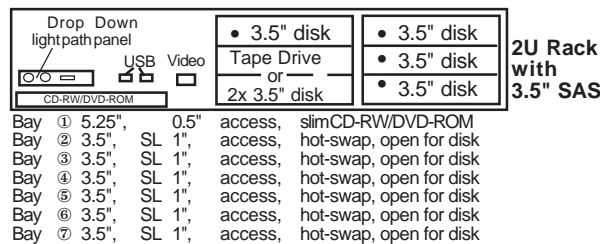
**Graphics** SVGA / ATI® RN50(ES1000) / front and rear ports / on planar / 16MB DDR std/max / 32-bit/33MHz PCI 2.3

**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](http://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

See footnotes for important warranty information

Max internal disk capacity:  
3.5" SAS models: 1.8TB<sup>2</sup> with six 300GB SL disks  
2.5" SAS models: 584GB<sup>2</sup> with eight 73.4GB SFF disks

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

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

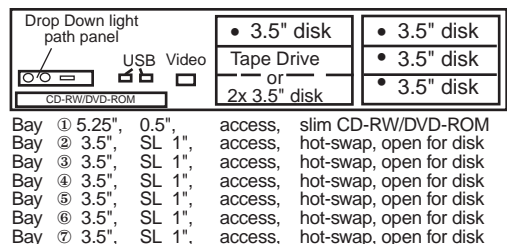
- ⊕ 3 year parts and labor
- ⊕ International Warranty Service<sup>3</sup>
- ⊕ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⊕ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding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



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-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

Positioning Processor	<b>2U Rack with high availability, scalability and expandability for application-serving Web environments</b> Up to 2 x Intel® Xeon Processor 3.16GHz with 1333MHz FSB / Quad-Core / <b>Extended Memory 64 Technology (EM64T)</b> / Enhanced Intel Speedstep Technology (EIST)
L2 cache	<b>12MB</b> / std and max / at processor speed
SMP support	<b>2-way SMP</b> / 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	<b>2GB</b> std / 48GB <sup>13</sup> max / two slots used / ten slots available / <b>PC2-5300 667MHz FBD 240-pin ECC DDR2-SDRAM DIMMs</b> / dual channel / 2-way memory interleave / DIMMs must be installed in matched pairs [a bank] / <b>Fully Buffered / Error Checking and Correcting (ECC)</b> (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) / <b>Active Memory™: memory mirroring, online-spare memory, Chipkill</b>
SAS/SATA controller	<b>Adaptec® AIC-9580W / dual channel SAS controller / eight port SAS or SATA</b> (300MB/sec SAS) (150MB/sec SATA) / hot-swap / on planar / PCI-Express / supports <b>RAID 0, 1 &amp; 10</b> / 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	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5000P chipset</b> / 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 / <b>Two Broadcom® 5708</b> / 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	<b>8X-24X<sup>6</sup> CD-RW/DVD-ROM / USB only</b>
Front & Rear ports	<b>Front:</b> two USB (Vers 2.0), graphics (DB-15) <b>Rear:</b> 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	<b>IBM Integrated Baseboard Management Controller(BMC)</b> / 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	<b>Drop down Light Path Diagnostics</b> panel providing LED map to failing part (located on front panel)	Xeon E5440 2.83GHz/1333MHz/12MB L2 Cache	44R5634
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director systems mgmt, others	Xeon X5450 3.0GHz/1333MHz/12MB L2 Cache	44E5122
Keyboard / mouse	None standard (because rack-based) / USB only	Xeon X5460 3.16GHz/1333MHz/12MB L2 Cache	44E5057
Power supply	<b>Std/Max:</b> 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	<b>Calibrated Vectors Cooling™</b> 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	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 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



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

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

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

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  
 See footnotes for important warranty information

Max internal disk capacity:  
 3.5" SAS models: 1.8TB<sup>2</sup> with six 300GB SL disks  
 3.5" SATA models: 4.5TB<sup>2</sup> with six 750GB disks  
 2.5" SAS models: 1.2TB<sup>2</sup> with eight 146GB SFF disks

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

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

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 / 16MB 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**

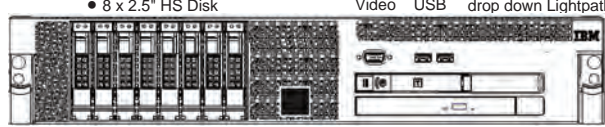
Diagnostics Security **Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode**

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

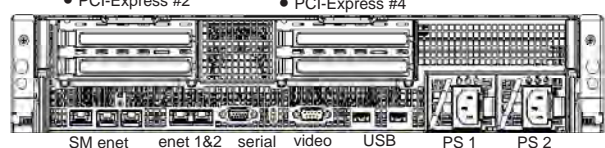
Power supply(s) **Std/Max: one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing**

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

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

<p><b>2U Rack with 2.5" HS SAS</b></p> <ul style="list-style-type: none"> <li>8 x 2.5" HS Disk</li> <li>Video</li> <li>USB</li> <li>drop down Lightpath panel</li> </ul>  <p>Filler panel (optional tape or 4 drive expansion)</p> <p>optical</p>	<ul style="list-style-type: none"> <li>Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache</li> <li>Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache</li> <li>Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache</li> <li>Xeon L5506 2.13GHz/4.8GTs/4MB L3 Cache</li> <li>Xeon L5520 2.26GHz/5.86GTs/8MB L3 Cache</li> <li>Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache</li> <li>Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache</li> <li>Xeon E5540 2.53GHz/5.86GTs/8MB L3 Cache</li> <li>Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache</li> <li>Xeon X5560 2.8GHz/6.4GTs/8MB L3 Cache</li> <li>Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache</li> <li>1x1GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM</li> <li>1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM</li> <li>1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM</li> <li>1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM</li> <li>IBM Virtual Media key</li> <li>PCI-Express (2x8) Riser card</li> <li>+4 HDD Drive Enablement kit</li> <li>Dual-port 1 Gb Ethernet Daughter card</li> <li>675 Watt Hot-swap Power Supply Option (US)</li> <li>IBM ServeRAID-MR10i SAS/SATA Controller</li> <li>73.4GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD</li> <li>146GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD</li> </ul>
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Other options at [ibm.com/products/us](http://ibm.com/products/us)

<ul style="list-style-type: none"> <li>PCI-Express #1</li> <li>PCI-Express #2</li> <li>PCI-Express #3</li> <li>PCI-Express #4</li> </ul>  <p>SM enet enet 1&amp;2 serial video USB PS 1 PS 2</p>	<ul style="list-style-type: none"> <li>Quick release adapter slots (no screws)</li> <li>Configuration/Setup Utility: F1 at startup</li> <li>Diagnostics (preboot DSA): F2 at startup</li> <li>Network Boot: F12 at startup</li> <li>Front indicators LEDs: Power-on LED, HDD activity LED, locator LED, system information LED, and system-error LED</li> <li>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</li> <li>Rack: H 3.36" x W 17.5" x D 27.5" (H 85.4mm x W 443.6mm x D 698mm)</li> <li>46.5 to 65 pounds</li> <li>Stealth black color</li> </ul>
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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

Max internal disk capacity:  
 2.5: SAS models: 2.4TB<sup>2</sup> with eight 300GB SFF disks(std)  
 2.5: SAS models: 3.6TB<sup>2</sup> with twelve 300GB SFF disks(opt)

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

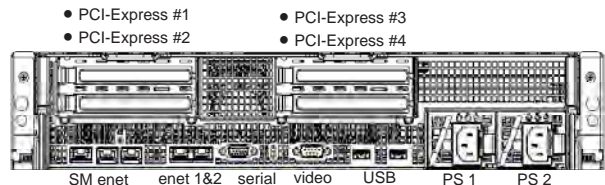
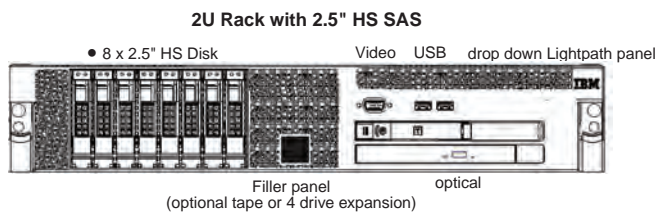
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding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

See footnotes for important warranty information

\*\* = 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)	<i>Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation</i> <b>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 /</b> up to 1.86GHz with 4MB L3 / 4 Core / Hyper-Threading <b>4 or 8MB</b> std and max / at processor speed <b>2-way SMP</b> / 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	
L3 cache SMP Implementation		
Memory	2, 4 or 8GB std / <b>64GB</b> max per processor(using 8GB DIMMs**) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring	
Disk Controller	<b>LSI Logic® 1068</b> SAS/SATA controller / up to eight port / on riser card / PCI-Express / supports <b>RAID-0/1/1E</b> / 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	<b>Eight 2.5-inch Small Form Factor (SFF)</b> 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	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5520 Chipset</b> / 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 (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	
BUS slots		
Ethernet	<b>Two</b> 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 <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 / 16MB DDR2-250MHz SDRAM std/max	
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / 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	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	
Publications Keyboard / mouse	<b>Installation Guide and Documentation CD</b> None standard (because rack-based) / USB only	Xeon E5502 1.86GHz/4.8GTs/4MB L3 Cache Xeon E5504 2.0GHz/4.8GTs/4MB L3 Cache Xeon E5506 2.13GHz/4.8GTs/4MB L3 Cache Xeon L5506 2.13GHz/4.8GTs/4MB L3 Cache Xeon L5520 2.26GHz/5.86GTs/8MB L3 Cache Xeon E5520 2.26GHz/5.86GTs/8MB L3 Cache Xeon E5530 2.4GHz/5.86GTs/8MB L3 Cache Xeon E5540 2.53GHz/5.86GTs/8MB L3 Cache Xeon X5550 2.66GHz/6.4GTs/8MB L3 Cache Xeon X5560 2.8GHz/6.4GTs/8MB L3 Cache Xeon X5570 2.93GHz/6.4GTs/8MB L3 Cache
Power supply(s)	<i>Std/Max:</i> one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	1x1GB (1Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM 1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM 1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM IBM Virtual Media key PCI-Express (2x8) Riser card +4 HDD Drive Enablement kit Dual-port 1 Gb Ethernet Daughter card 675 Watt Hot-swap Power Supply Option (US) IBM ServeRAID-MR10i SAS/SATA Controller 73.4GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD 146GB 10K-rpm SAS SFF slim-HS 2.5" (SFF tray) HDD
Cooling	<b>Calibrated Vecteded Cooling™</b> <i>Std/Max:</i> three / hot-swap redundant / variable speed / PFA	
Prerequisites	Monitor, keyboard, mouse, SAS/SATA disk, rack, OS	



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

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

- ↳ 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: 2.4TB<sup>2</sup> with eight 300GB SFF disks(std)  
2.5: SAS models: 3.6TB<sup>2</sup> with twelve 300GB SFF disks(opt)

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

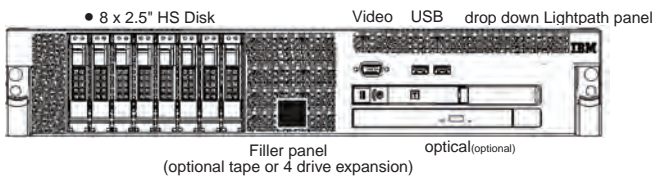
- ↳ 3 year parts and labor
- ↳ International Warranty Service<sup>3</sup>
- ↳ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↳ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding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

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

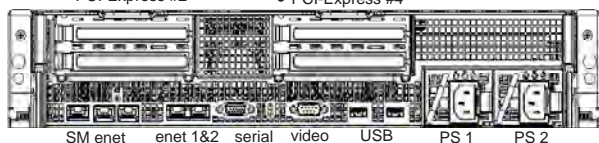
Positioning Processor(s)	<b>Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation</b> <b>Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) technology at up to 2.93GHz with 8MB L3 / 4 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>										
L3 cache SMP Implementation	<b>8MB</b> std and max / at processor speed <b>2-way SMP</b> / 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	<b>4GB std / 64GB max</b> per processor(using 8GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / sixteen slots on systemboard / eight DIMMS per processor / ChipKill / memory mirroring										
Disk Controller	<b>IBM ServeRAID 5015</b> SAS/SATA controller / up to eight 6Gb/s ports / on riser card / PCI-Express / supports <b>RAID-0/1/5/6/10/50/60</b> / battery backed cache / SATA controller for optional optical integrated into ICH10										
Disk bays Flash Storage Tape backup	<b>Eight 2.5-inch Small Form Factor (SFF)</b> 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	<b>EIA 19" Rack (2U<sup>1</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5520 Chipset</b> / 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	<b>Two Gigabit Ethernet ports / Broadcom® 5709C</b> / 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 / 16MB DDR2-250MHz SDRAM std/max										
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / 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	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode										
Publications Keyboard / mouse	<b>Installation Guide and Documentation CD</b> 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	<b>Calibrated Vecteded Cooling™</b> <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: 4TB<sup>2</sup> with eight 500GB SFF disks(std)  
2.5: SAS models: 6TB<sup>2</sup> with twelve 500GB SFF disks(opt)

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

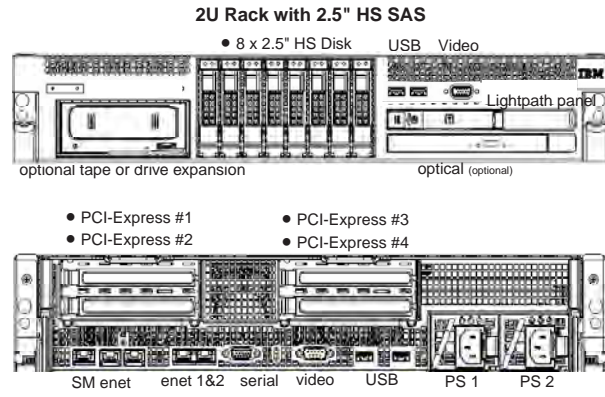
- ↳ 3 year parts and labor
- ↳ International Warranty Service<sup>3</sup>
- ↳ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↳ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding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

See footnotes for important warranty information

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date	
7945-A2x	1 x Xeon® E5506	2.13GHz/4C	4MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	4 hot-swap	4x5	2 x Gb	Mar 2010
7945-B2x	1 x Xeon E5507	2.26GHz/4C	4MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-C2x	1 x Xeon L5630	2.13GHz/4C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-D2x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-F2x	2 x Xeon E5630	2.53GHz/4C	12MB	2x4GB	2.5" Open	SAS/SATA	open	2 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-G2x	1 x Xeon E5640	2.66GHz/4C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-H2x	1 x Xeon L5640	2.26GHz/6C	12MB	1x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-J2x	1 x Xeon X5650	2.66GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-L2x	1 x Xeon X5660	2.80GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-M2x	1 x Xeon X5670	2.93GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010
7945-N2x	1 x Xeon X5680	3.33GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2010

Positioning Processor(s)	<b>Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 3.33GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>	
L3 cache	4 or 12MB std and max / at processor speed	
SMP Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size)	
Memory	Systemboard contains two Socket B (LGA1366) sockets, eighteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers	
Disk Controller	4, 8 or 12GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs (or up to 12 DIMMS / 24GB of UDIMM)</b> / eighteen slots on systemboard / nine DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors	
Disk bays	<b>IBM ServeRAID BR10iL v2</b> SAS/SATA controller / A2x / on riser card / PCI-Express / supports <b>RAID-0/1/E</b> / <b>IBM ServeRAID M1015</b> SAS/SATA controller / B2x, C2x, D2x, H2x, N2x / on riser card / PCI-Express / supports <b>RAID-0/1/10 / IBM ServeRAID M5014</b> SAS/SATA controller / F2x, G2x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50 / IBM ServeRAID M5015</b> with battery / J2x, L2x, M2x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50</b> / SATA controller for optional optical integrated into ICH10	
Flash Storage	<b>Eight 2.5-inch Small Form Factor (SFF)</b> hot swap disk bays std / optional expansion to sixteen SFF hot swap disk bays / supports SAS, SATA or SSD SFF HS disks , allow mixing different drives	
Tape backup	USB-based slot on SAS riser card for optional Hypervisor USB key	
Mechanical Architecture/Chipset	Optional internal and external / 3.5" / USB or SATA connected via SAS riser card	
BUS slots	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5520 Chipset</b> / 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 SAS/SATA controller and LPC bus to VSC452 for video and limited Super I/O (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	<b>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</b>	
Optical / diskette	Optional optical / USB only	
Front & Rear ports	<b>Front:</b> two USB (Vers 2.0), graphics (DB-15) <b>Rear:</b> 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 / 16MB DDR2-250MHz SDRAM std/max	
Systems Mgmt	<b>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</b>	
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics	
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode	

Publications	<b>Installation Guide and Documentation CD</b>	Xeon E5506 2.13GHz / 4C / 4MB L3 Cache	46M1079
Keyboard / mouse	None standard (because rack-based) / USB only	Xeon E5507 2.26GHz / 4C / 4MB L3 Cache	59Y4016
Power supply(s)	<i>Std/Max:</i> one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	Xeon E5620 2.4GHz / 4C / 12MB L3 Cache	59Y4020
Cooling	<b>Calibrated Vectored Cooling™</b> <i>Std/Max:</i> three / hot-swap	Xeon E5630 2.53GHz / 4C / 12MB L3 Cache	59Y4021
		Xeon E5640 2.66GHz / 4C / 12MB L3 Cache	59Y4022
		Xeon L5630 2.13GHz / 4C / 12MB L3 Cache	59Y4018
		Xeon L5640 2.26GHz / 6C / 12MB L3 Cache	59Y4019
		Xeon X5650 2.66GHz / 6C / 12MB L3 Cache	59Y4023
		Xeon X5660 2.80GHz / 6C / 12MB L3 Cache	59Y4024
		Xeon X5670 2.93GHz / 6C / 12MB L3 Cache	59Y4025
		Xeon X5680 3.33GHz / 6C / 12MB L3 Cache	59Y4028
		1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1433
		1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1434
		1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1435
		1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1436
		IBM Virtual Media key	46C7526
		PCI-Express (2x8) Riser card	46M1072
		+8 HDD Drive Enablement kit	59Y3825
		Dual-port 1 Gb Ethernet Daughter card	46M1076
		675 Watt Hot-swap Power Supply Option (US)	46M1075
		Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	



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

Max internal disk capacity:  
 2.5: SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks(std)  
 2.5: SAS models: 8TB<sup>2</sup> with sixteen 500GB SFF disks(opt)

- ⇒ 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 55 pounds
- ⇒ Stealth black color

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

- ⇒ 3 year parts and labor
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇒ 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding holidays, 4 hr response time (ServicePac<sup>2</sup> 21P2077)
  - 24 hr x 7 day coverage, 4 hour average response time (ServicePac 21P2078)
  - 24 hr x 7 day coverage, 2 hour average response time (ServicePac 21P293)
- ⇒ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

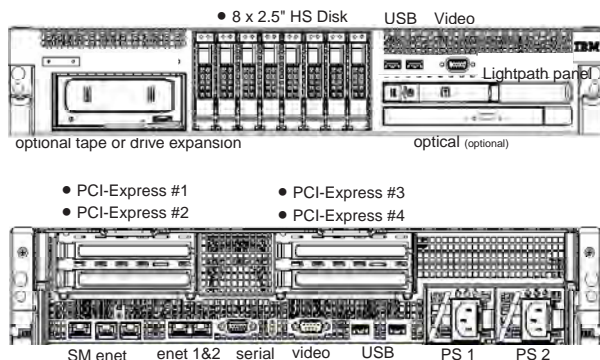
See footnotes for important warranty information

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Disk controller	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date	
7945-E1x	1 x Xeon® E5507	2.26GHz/4C	4MB	3x2GB	2.5" Open	SAS/SATA	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Apr 2010
7945-E2x	1 x Xeon E5620	2.40GHz/4C	12MB	3x4GB	2.5" Open	SAS/SATA	dvd	2 x 675W	8 hot-swap	4x9	2 x Gb	Apr 2010
7945-E3x	1 x Xeon X5650	2.66GHz/6C	12MB	3x4GB	2.5" Open	SAS/SATA	multi	2 x 675W	8 hot-swap	4x9	2 x Gb	Apr 2010

Positioning Processor(s)	<i>Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation</i> <b>Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 2.66GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>
L3 cache	4 or 12MB 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, eighteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers
Memory	4, 8 or 12GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs (or up to 12 DIMMS / 24GB of UDIMM)</b> / eighteen slots on systemboard / nine DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors
Disk Controller	<b>IBM ServeRAID BR10iL v2</b> SAS/SATA controller / on riser card / PCI-Express / supports <b>RAID-0/1/1E / IBM ServeRAID M1015</b> SAS/SATA controller / E1x / on riser card / PCI-Express / supports <b>RAID-0/1/10 / IBM ServeRAID M5014</b> SAS/SATA controller / E2x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50 / IBM ServeRAID M5015</b> with battery / E3x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50 / SATA</b> controller for optional optical integrated into ICH10
Disk bays	<b>Eight 2.5-inch Small Form Factor (SFF)</b> hot swap disk bays std / optional expansion to sixteen SFF hot swap disk bays / supports SAS, SATA or SSD SFF HS disks , allow mixing different drives
Flash Storage	USB-based slot on SAS riser card for optional Hypervisor USB key
Tape backup	Optional internal and external / 3.5" / USB or SATA connected via SAS riser card
Mechanical Architecture/Chipset	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5520 Chipset</b> / 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 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	<b>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</b> Optional optical / USB only
Optical / diskette	<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
Front & Rear ports	SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max
Graphics	
Systems Mgmt	<b>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</b>
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Publications	<b>Installation Guide and Documentation CD</b>	Xeon E5506 2.13GHz / 4C / 4MB L3 Cache	46M1079
Keyboard / mouse	None standard (because rack-based) / USB only	Xeon E5507 2.26GHz / 4C / 4MB L3 Cache	59Y4016
Power supply(s)	<i>Std/Max:</i> one/two 675 watt hot-swap / rear access / auto restart / redundant with two power supplies / auto-sensing	Xeon E5620 2.4GHz / 4C / 12MB L3 Cache	59Y4020
Cooling	<b>Calibrated Vectored Cooling™</b> <i>Std/Max:</i> three / hot-swap	Xeon E5630 2.53GHz / 4C / 12MB L3 Cache	59Y4021
		Xeon E5640 2.66GHz / 4C / 12MB L3 Cache	59Y4022
		Xeon L5630 2.13GHz / 4C / 12MB L3 Cache	59Y4018
		Xeon L5640 2.26GHz / 6C / 12MB L3 Cache	59Y4019
		Xeon X5650 2.66GHz / 6C / 12MB L3 Cache	59Y4023
		Xeon X5660 2.80GHz / 6C / 12MB L3 Cache	59Y4024
		Xeon X5670 2.93GHz / 6C / 12MB L3 Cache	59Y4025
		Xeon X5680 3.33GHz / 6C / 12MB L3 Cache	59Y4028
		1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1433
		1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1434
		1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1435
		1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1436
		IBM Virtual Media key	46C7526
		PCI-Express (2x8) Riser card	46M1072
		+8 HDD Drive Enablement kit	59Y3825
		Dual-port 1 Gb Ethernet Daughter card	46M1076
		675 Watt Hot-swap Power Supply Option (US)	46M1075
		Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	

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

Max internal disk capacity:  
2.5: SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks(std)  
2.5: SAS models: 8TB<sup>2</sup> with sixteen 500GB SFF disks(opt)

- 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 55 pounds
- Stealth black color

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

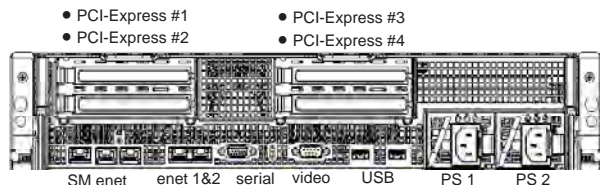
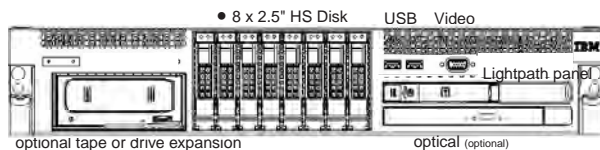
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- 3 year on site warranty service upgrade options (in eligible locations):<sup>7</sup>
  - 9 hr coverage, Mon-Fri excluding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

See footnotes for important warranty information

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date	
7945-12x	1 x Xeon® E5603	1.80GHz/4C	4MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-22x	1 x Xeon E5606	2.13GHz/4C	8MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-32x	1 x Xeon E5607	2.26GHz/4C	8MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-D4x	1 x Xeon E5620	2.40GHz/4C	12MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-H4x	1 x Xeon L5640	2.26GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-52x	1 x Xeon E5645	2.40GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-54x	1 x Xeon E5645	2.40GHz/6C	12MB	2x4GB	2.5" Open	open	2 x 675W HE	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-62x	1 x Xeon E5649	2.53GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011

Positioning Processor(s)	<i>Flagship business critical server to significantly lower Total Cost of Ownership packed with IBM innovation</i> <b>Up to two Next Generation Intel® Xeon processors featuring Quick Path Interconnect(QPI) technology at up to 3.46GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>		
L3 cache SMP Implementation	Up to 12MB 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, eighteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers		
Memory	Up to 12GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs (or up to 12 DIMMS / 24GB of UDIMM)</b> / eighteen slots on systemboard / nine DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors		
Disk Controller	<b>IBM ServeRAID BR10iL v2</b> SAS/SATA controller / 12x / on riser card / PCI-Express / supports <b>RAID-0/1/1E / PCI ServeRAID M1015</b> SAS/SATA controller / 22x, 32x, D4x / on riser card / PCI-Express / supports <b>RAID-0/1/10 / IBM ServeRAID M5014</b> SAS/SATA controller / 52x, 54x, 62x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50 / IBM ServeRAID M5015</b> with battery / H4x / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50 / SATA</b> controller for optional optical integrated into ICH10		
Disk bays	<b>Eight 2.5-inch Small Form Factor (SFF)</b> hot swap disk bays std / optional expansion to sixteen SFF hot swap disk bays / supports SAS, SATA or SSD SFF HS disks , allow mixing different drives		
Flash Storage Tape backup	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	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion <b>Intel 5520 Chipset</b> / 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 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	<b>Two Gigabit Ethernet ports / Broadcom® 5709C</b> / 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 / 16MB DDR2-250MHz SDRAM std/max		
Systems Mgmt	<b>Integrated Management Module (IMM)</b> / 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	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode		
Publications Keyboard / mouse	<b>Installation Guide and Documentation CD</b> None standard (because rack-based) / USB only	Xeon E5506 2.13GHz / 4C / 4MB L3 Cache Xeon E5507 2.26GHz / 4C / 4MB L3 Cache Xeon E5620 2.4GHz / 4C / 12MB L3 Cache Xeon E5630 2.53GHz / 4C / 12MB L3 Cache Xeon E5640 2.66GHz / 4C / 12MB L3 Cache Xeon L5630 2.13GHz / 4C / 12MB L3 Cache Xeon L5640 2.26GHz / 6C / 12MB L3 Cache Xeon X5650 2.66GHz / 6C / 12MB L3 Cache Xeon X5660 2.80GHz / 6C / 12MB L3 Cache Xeon X5670 2.93GHz / 6C / 12MB L3 Cache Xeon X5680 3.33GHz / 6C / 12MB L3 Cache	46M1079 59Y4016 59Y4020 59Y4021 59Y4022 59Y4018 59Y4019 59Y4023 59Y4024 59Y4025 59Y4028 49Y1433 49Y1434 49Y1435 49Y1436 46C7526 46M1072 59Y3825 46M1076 46M1075
Power supply(s)	Std/Max: one or two/two 460W, 675W or 675W HE / hot-swap / rear access / auto restart / redundant with two / auto-sensing		
Cooling	<b>Calibrated Vectored Cooling™</b> Std/Max: three / hot-swap		

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

Max internal disk capacity:  
2.5: SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks(std)  
2.5: SAS models: 8TB<sup>2</sup> with sixteen 500GB SFF disks(opt)

- 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 55 pounds
- Stealth black color

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

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

IBM® Type-model	Qty x Processor/Core	L3 cache	Memory	Disk	Optical	Power Supply	Disk bays	Slots x bays	Ethernet	Available date
7945-J4x	1 x Xeon® X5650 2.66GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-J6x	2 x Xeon X5650 2.66GHz/6C	12MB	6x4GB	2.5" Open	multiburner	2 x 675W HE	8 hot-swap	4x9	2 x Gb	Apr 2011
7945-L4x	1 x Xeon X5660 2.80GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-72x	1 x Xeon X5675 3.06GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 675W HE	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-82x	1 x Xeon X5690 3.46GHz/6C	12MB	1x4GB	2.5" Open	open	1 x 675W HE	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-E4x	1 x Xeon E5607 2.26GHz/4C	12MB	3x2GB	2.5" Open	multiburner	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-E5x	1 x Xeon E5620 2.40GHz/4C	12MB	3x2GB	2.5" Open	multiburner	1 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-E6x	1 x Xeon E5649 2.53GHz/6C	12MB	3x4GB	2.5" Open	multiburner	2 x 460W	8 hot-swap	4x9	2 x Gb	Mar 2011
7945-E7x	1 x Xeon X5675 3.06GHz/6C	12MB	6x4GB	2.5" Open	multiburner	2 x 675W	8 hot-swap	4x9	2 x Gb	Mar 2011

**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 processors featuring Quick Path Interconnect(QPI) technology at up to 3.46GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading**

**L3 cache SMP Implementation** Up to 12MB 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, eighteen DIMM slots, four PCI-E slots, integrated SAS, ethernet and graphics controllers

**Memory** Up to 24GB std / **96GB max** per processor(using 16GB DIMMs) / **PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs (or up to 12 DIMMS / 24GB of UDIMM)** / eighteen slots on systemboard / nine DIMMS per processor / ChipKill / memory mirroring / Supports two DIMMs per channel at 1333MHz for L5640 and X5600 series processors

**Disk Controller** **IBM ServeRAID BR10iL v2** SAS/SATA controller / on riser card / PCI-Express / supports **RAID-0/1/1E / IBM ServeRAID M1015** SAS/SATA controller / E4x, E5x, E6x / on riser card / PCI-Express / supports **RAID-0/1/10 / IBM ServeRAID M5014** SAS/SATA controller / on riser card / PCI-Express / supports **RAID-0/1/10/5/50 / IBM ServeRAID M5015** with battery / J4x, J6x, L4x, 72x, 82x, E7x / on riser card / PCI-Express / supports **RAID-0/1/10/5/50 / SATA controller for optional optical integrated into ICH10**

**Disk bays** **Eight 2.5-inch Small Form Factor (SFF)** hot swap disk bays std / optional expansion to sixteen SFF hot swap disk bays / supports SAS, SATA or SSD SFF HS disks , allow mixing different drives

**Flash Storage** USB-based slot on SAS riser card for optional Hypervisor USB key

**Tape backup** Optional internal and external / 3.5" / USB or SATA connected via SAS riser card

**Mechanical Architecture/Chipset** **EIA 19" Rack (2U<sup>4</sup>)** / 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 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** Optional optical / 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 / Matrox G200eV integrated in IMM on systemboard / 16MB 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

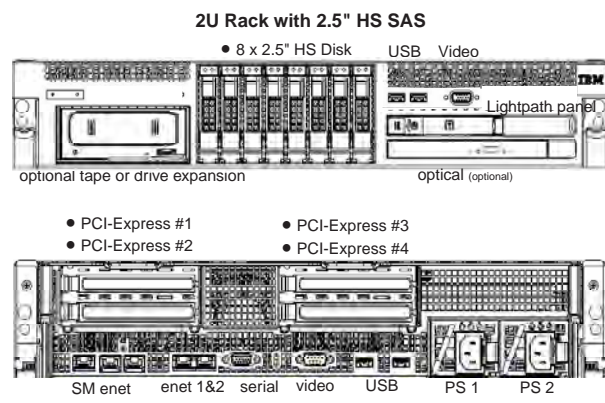
**Publications** **Installation Guide and Documentation CD**

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

**Power supply(s)** *Std/Max:* one or two/two 460W, 675W or 675W HE / hot-swap / rear access / auto restart / redundant with two / auto-sensing

**Cooling** **Calibrated Vectored Cooling™** *Std/Max:* three / hot-swap

Xeon E5506 2.13GHz / 4C / 4MB L3 Cache	46M1079
Xeon E5507 2.26GHz / 4C / 4MB L3 Cache	59Y4016
Xeon E5620 2.4GHz / 4C / 12MB L3 Cache	59Y4020
Xeon E5630 2.53GHz / 4C / 12MB L3 Cache	59Y4021
Xeon E5640 2.66GHz / 4C / 12MB L3 Cache	59Y4022
Xeon L5630 2.13GHz / 4C / 12MB L3 Cache	59Y4018
Xeon L5640 2.26GHz / 6C / 12MB L3 Cache	59Y4019
Xeon X5650 2.66GHz / 6C / 12MB L3 Cache	59Y4023
Xeon X5660 2.80GHz / 6C / 12MB L3 Cache	59Y4024
Xeon X5670 2.93GHz / 6C / 12MB L3 Cache	59Y4025
Xeon X5680 3.33GHz / 6C / 12MB L3 Cache	59Y4028
1x2GB (2Rx8) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1433
1x2GB (1Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1434
1x4GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1435
1x8GB (2Rx4) PC3-10600 DDR3 SDRAM Registered DIMM	49Y1436
IBM Virtual Media key	46C7526
PCI-Express (2x8) Riser card	46M1072
+8 HDD Drive Enablement kit	59Y3825
Dual-port 1 Gb Ethernet Daughter card	46M1076
675 Watt Hot-swap Power Supply Option (US)	46M1075
Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	



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

Max internal disk capacity:  
 2.5: SAS models: 4TB<sup>2</sup> with eight 500GB SFF disks(std)  
 2.5: SAS models: 8TB<sup>2</sup> with sixteen 500GB SFF disks(opt)

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

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



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 <sup>4</sup> 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 <sup>2</sup> 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> <b>2 x Intel® Xeon 3.2GHz with 800MHz FSB / Optimized for Extended Memory 64 Technology™ (EM64T) / Hyper-Threading</b>
L2 cache Implementation	<b>2MB</b> 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 <b>2-way SMP</b> via second identical processor is standard
Memory	<b>2GB std / 16GB<sup>13</sup> max / PC2-3200</b> 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 / <b>Error Checking and Correcting (ECC) / Active Memory™</b> : online spare and memory mirror / <b>Chipkill™</b> supported
SCSI disk controller	<b>LSI® LSI53C1030 / Ultra320 SCSI controller</b> (LVD 320MB/sec) / dual-channel / on planar / 64-bit PCI / Fusion-MPT™ architecture
SCSI channels	<b>SCSI Channel A</b> : one internal 16-bit 80-pin LVD cable from controller to two-bay disk drive carrier <b>SCSI Channel B</b> : external 16-bit .8mm VHDCI 68-pin external connector (no cables)
SCSI disk	<b>Up to two 300GB</b> Ultra320 SCSI, 15K rpm, 4.9ms read seek, S.M.A.R.T. <sup>5</sup> / 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	<b>EIA 19" Rack (2U<sup>4</sup>) x 20-inch deep</b> Designed for installation in a two-post, 19" rack unit only (not supported in IBM NetBAY™ Racks) / ships with rack mount kit
PCI bus slots	(See below) three full height full length 64-bit 133MHz slots / three low-profile half length 64-bit 66MHz PCI slots / PCI 2.2 / peer PCI buses / no hot-swap Active™ PCI slots
Chipset	<b>Intel® E7520 chipset</b> / 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-10X <sup>6</sup> slim-line CD-DVD ROM (applies to 51X, 53X, 54X & 55X models) (52X model CD-ROM only) / USB only <b>Rear</b> : 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 <b>Front</b> : 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	<b>External alarm panel</b> in front bezel provides 24x7 surveillance of critical, major and minor errors and power outages / four alarm panel LEDs: power alarm fault, critical alarm fault, major alarm fault, minor alarm fault
Status LEDs	<b>Operator Information Panel</b> (in front) / includes switches (NMI, power, reset) and status LEDs (NIC, disk, main power)
Systems mgmt	<b>Integrated service processor</b> (Baseboard Management Controller) / on planar / failures or thresholds in fans, memory, processors, temperature, voltage, and power supplies activate alarm panel LEDs /
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	<b>Std/Max</b> : two / rear accessible / <b>AC 600 watt (220V ) or DC 600 watt (-48 to -60 V dc)</b> / supports dual input sources / <b>(1+1) redundant / hot-swap</b> / 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: 600GB<sup>2</sup> with two 300GB SL disks

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

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

IBM® Type-model	Qty x Processor	Core	QPI	L3	Memory	DIMM slots	Disk controller	Ethernet	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7148-ARU	1 x Xeon™ E7520	1.86GHz	4	4.8GT/s	18MB	2x4GB	16	open	2 x 1Gb	2U <sup>4</sup> rack	5x1	1 x 675W	3 Aug 2010
7148-1RU	1 x Xeon E7520	1.86GHz	4	4.8GT/s	18MB	2x4GB	16	SAS	2 x 1Gb	2U rack	5x5	1 x 675W	3 Aug 2010
7148-2RU	1 x Xeon E6540	2.0GHz	6	6.4GT/s	18MB	2x4GB	16	SAS	2 x 1Gb	2U rack	5x5	1 x 675W	3 Aug 2010
7148-3RU	2 x Xeon X6550	2.0GHz	8	6.4GT/s	18MB	4x4GB	16	SAS	2 x 1Gb	2U rack	5x5	1 x 675W	3 Aug 2010
7148-3GU	2 x Xeon X6550	2.0GHz	8	6.4GT/s	18MB	4x4GB	16	SAS	2 x 10Gb	2U rack	5x5	1 x 675W	3 Aug 2010
7148-4RU	2 x Xeon X7560	2.26GHz	8	6.4GT/s	24MB	4x4GB	16	SAS	2 x 1Gb	2U rack	5x5	1 x 675W	3 Aug 2010
7148-E3U	2 x Xeon X7550	2.0GHz	8	6.4GT/s	18MB	4x4GB	32	SAS	2 x 1Gb	2U rack	5x5	2 x 675W	3 Aug 2010
7148-3DU	2 x Xeon X6550	2.0GHz	8	6.4GT/s	18MB	4x4GB	16	open	2 x 1Gb	2U rack	5x1	4 x 675W	3 Aug 2010

**Processors** Up to Two Next-Generation Intel® Xeon™ EX Processors featuring Quick Path Interconnect(QPI) technology at up to 2.26GHz<sup>1</sup> / up to Eight-Core / Hyper-Threading / Turbo (excludes ARU and 1RU)  
**L3 cache** 18 or 24MB / shared  
**Processor upgrade Implementation** 2-way SMP / up to two Xeon EX Processors (same speed/cache size)  
 Systemboard contains two Socket-LS(1567-pin LGA) sockets, sixteen dimm slots, memory mezzanine connector, riser card slots supporting up to four PCI-E slots, SAS adapter x8 slot, integrated 2 x 1Gb ethernet and graphics

**Memory** 8 or 16GB std / PC3-10600 1066MHz LP 240-pin Registered ECC DIMMs / sixteen dimm slots std, expandable to thirty-two dimm slots with memory mezzanine option on base system / DIMMs must be installed in matched pairs / Memory ProteXion™, Chipkill™, Memory Mirroring™ and sparing

**SAS/SATA disk controller** ServeRAID M1015 / LSI SAS2008 / SAS / 6Gb / RAID 0/1/10 (optional 5/50) / std on most (except ARU & 3DU)  
**IBM ServeRAID M1015** SAS/SATA controller / std on most (except ARU & 3DU) / on riser card / PCI-Express / supports RAID-0/1/10 / **IBM ServeRAID M5015** with battery / E3x / on riser card / PCI-Express / supports RAID-0/1/10/5/50 /

**SAS connectors** Controller wired to SAS backplane  
**Disk** Supports up to 4 std on most / 16 max - 2.5" SFF or 24 - 1.8" SSD disks / SAS / SATA / SSD / mixed use supported

**Mechanical** EIA 19" rack models (2U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks

**Chipset** Intel 7500 chipset / IO Hub provides PCI-E slots and interface to ICH10 Southbridge / ICH10 provides: USB, SATA to DVD, PCI-E to BCM5709C and video, LPC bus to IMM  
**Slots** Five PCI-E slots standard via riser cards (see below)  
**Optical / diskette** Optional / 24x/8x<sup>6</sup> CD-RW/DVD Combo / SATA / none  
**Ethernet** Broadcom® 5709C 10/100/1000 dual-port ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 / TOE / standard / Emulex® 10Gb Virtual Fabric adapter optional (except 3GU) / consumes PCI-E slot 5  
**Ports** Rear: Two QPI, one systems management ethernet, one serial, four USB(2.0), DB-15 graphics and two ethernet / Front: DB-15 graphics, two USB (2.0)

**Graphics** SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max  
**Systems Management** 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 standard  
**Diagnostics** Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics  
**Security** Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

**Publications** Installation Guide and Documentation CD  
**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) / USB only

**Power supplies** Up to four 675W Std/Max / rear-access / hot-swap / worldwide / voltage-sensing / auto-restart / PFA / N + N redundancy  
**Cooling fans** Five, hot-swappable system fans / one additional fan in each power supply / PFA / fan failure signals LED and IMM

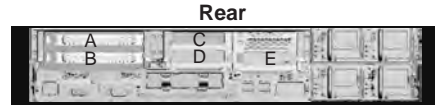
2GB PC3-10600 CL4 ECC DDR3 RDIMM	44T1481
4GB PC3-8500 CL5 ECC DDR3 RDIMM	46C7448
8GB PC3-8500 CL5 ECC DDR3 RDIMM	46C7482
16GB PC3-8500 CL5 ECC DDR3 RDIMM	46C7483
IBM x3690 X5 Internal Memory Expansion	60Y0323
Xeon E6540 2.0GHz/18MB L3 / 6C	60Y0320
Xeon E7520 1.86GHz/18MB L3 / 4C	60Y0317
Xeon E7530 1.86GHz/12MB L3 / 6C	60Y0316
Xeon X6550 2.0GHz/18MB L3 / 8C	60Y0319
Xeon X7550 2.0GHz/18MB L3 / 8C	60Y0313
Xeon X7560 2.26GHz/24MB L3 / 8C	60Y0311
IBM ServeRAID-M5015 SAS/SATA Controller	46M0829
IBM ServeRAID-M1015 SAS/SATA Controller	46M0831
IBM ServeRAID-M1000 Series Advance Feature Key	46M0832
IBM ServeRAID-M5000 Series Advance Feature Key	46M0930
IBM 500G GB 7200 2.5" SAS Hot-swap HDD	42D0707
IBM 50GB 2.5" SFF SSD	43W7714
IBM UltraSlim Enhanced SATA Multi-burner	46M0902
IBM 675W Redundant Power Supply Kit	60Y0327
IBM PCIe x16 Adapter 3/4 Video	60Y0331
IBM PCIe x16 Adapter Full Video	60Y0337

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



**Front**

Bay 0	2.5"	SL 1"	access, hot-swap, open (except ARU & 3DU)
Bay 1	2.5"	SL 1"	access, hot-swap, open (except ARU & 3DU)
Bay 2	2.5"	SL 1"	access, hot-swap, open (except ARU & 3DU)
Bay 3	2.5"	SL 1"	access, hot-swap, open (except ARU & 3DU)
Bay 4	2.5"	SL 1"	access, hot-swap, optional
Bay 5	2.5"	SL 1"	access, hot-swap, optional
Bay 6	2.5"	SL 1"	access, hot-swap, optional
Bay 7	2.5"	SL 1"	access, hot-swap, optional
Bay 8	2.5"	SL 1"	access, hot-swap, optional
Bay 9	2.5"	SL 1"	access, hot-swap, optional
Bay 10	2.5"	SL 1"	access, hot-swap, optional
Bay 11	2.5"	SL 1"	access, hot-swap, optional
Bay 12	2.5"	SL 1"	access, hot-swap, optional
Bay 13	2.5"	SL 1"	access, hot-swap, optional
Bay 14	2.5"	SL 1"	access, hot-swap, optional
Bay 15	2.5"	SL 1"	access, hot-swap, optional
Bay 16	5.25", 0.5"		access, for optional optical



**Rear**

Riser 1: A - Slot 1 - full-height, full-length, PCI-E x8  
 B - Slot 2 - full-height, half-length, PCI-E x8  
 or  
 Riser 1: A - Slot 1 - full-height, full-length, PCI-E x16 (optional)

Riser 2: C - Slot 3 - low profile, PCI-E x8  
 D - Slot 4 - low profile, PCI-E x4(x8 mech)  
 E - Slot 5 - low profile, PCI-E x8 (extended connector for Emulex 10Gb)

- Dimensions: H3.4" x W17.32" x D28.04"
- Dimensions: H173mm x W440mm x D712mm
- Weight: 78 to 110lbs; 35.4 to 49.9kg
- 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
- 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, and fans with IBM Director

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

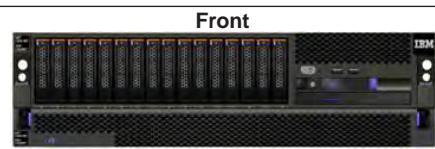
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response 88Y8307
  - 3 year IOR 24x7, 2 hr avg response 88Y8308
  - 4 year IOR 9x5, NBD response 88Y8309
  - 5 year IOR 9x5, NBD response 88Y8313
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

\*\*\*Full-length adapters cannot be used in conjunction with memory mezzanine

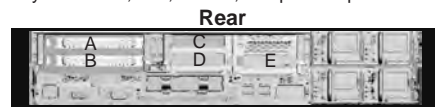
IBM® Type-model	Qty x Processor	Core	QPI	L3	Memory	DIMM slots	Disk controller	Ethernet	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date	
7148-2DU	2 x Xeon™ E6540	2.0GHz	6	6.4GT/s	18MB	64x4GB	32+32	SAS	2 x 10Gb	3U <sup>4</sup> rack	5x5	4 x 675W	3	Oct 2010
7148-3SU	1 x Xeon X7550	2.0GHz	8	6.4GT/s	18MB	4x4GB	16+32	SAS	2 x 1Gb	3U rack	5x5	2 x 675W	3	Oct 2010
7148-4SU	1 x Xeon X7560	2.26GHz	8	6.4GT/s	24MB	4x4GB	16+32	SAS	2 x 1Gb	3U rack	5x5	2 x 675W	3	Oct 2010

Processors	<b>Up to Two Next-Generation Intel® Xeon™ EX Processors featuring Quick Path Interconnect(QPI) technology at up to 2.26GHz<sup>1</sup> / up to Eight-Core / Hyper-Threading / Turbo</b>
L3 cache	<b>18 or 24MB / shared</b>
Processor upgrade Implementation	<b>2-way SMP</b> / up to two Xeon EX Processors (same speed/cache size) Systemboard contains two Socket-LS(1567-pin LGA) sockets, sixteen dimm slots, memory mezzanine connector, riser card slots supporting up to four PCI-E slots, SAS adapter x8 slot, integrated 2 x 1Gb ethernet and graphics
Memory	<b>8 or 128GB std / PC3-10600 1066MHz LP 240-pin Registered ECC DIMMs</b> / sixteen dimm slots std, expandable to thirty-two dimm slots with memory mezzanine option on base system(std on 2DU) / DIMMs must be installed in matched pairs / Memory ProteXion™, Chipkill™, Memory Mirroring™ and sparing
MAX5	8 or 128GB std / 2 or 32 x 4GB DIMMs / 1U / tool-free / memory expansion drawer / std / system max of 64 DIMM slots
SAS/SATA disk controller	<b>IBM ServeRAID M1015</b> SAS/SATA controller / std / on riser card / PCI-Express / supports <b>RAID-0/1/10 / IBM ServeRAID M5015</b> with battery / optional / on riser card / PCI-Express / supports <b>RAID-0/1/10/5/50 /</b>
SAS connectors	Controller wired to SAS backplane
Disk	Supports up to 4 std on most / 16 max - 2.5" SFF or 24 - 1.8" SSD disks / SAS / SATA / SSD / mixed use supported
Mechanical	<b>EIA 19" rack models (3U<sup>4</sup>) x 28" deep</b> / supported in NetBAY™ Racks
Chipset	<b>Intel 7500 chipset</b> / IO Hub provides PCI-E slots and interface to ICH10 Southbridge / ICH10 provides: USB, SATA to DVD, PCI-E to BCM5709C and video, LPC bus to IMM
Slots	Five PCI-E slots standard via riser cards (see below)
Optical / diskette	Optional / 24x/8x <sup>6</sup> CD-RW/DVD Combo / SATA / none
Ethernet	Broadcom® 5709C 10/100/1000 dual-port ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 / TOE / standard / Emulex® 10Gb Virtual Fabric adapter optional (except 2DU) / consumes PCI-E slot 5
Ports	Rear: Two QPI, one systems management ethernet, one serial, four USB(2.0), DB-15 graphics and two ethernet / Front: DB-15 graphics, two USB (2.0)
Graphics	SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max
Systems Management	<b>Integrated Management Module (IMM)</b> / 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 standard
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Publications	<b>Installation Guide and Documentation CD</b>
Diagnostics	<b>Light Path Diagnostics Card</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based) / USB only

Power supplies	Up to four 675W <i>Std/Max</i> / rear-access / hot-swap / worldwide / voltage-sensing / auto-restart / PFA / N + N redundancy	2GB PC3-10600 CL9 ECC DDR3 RDIMM 4GB PC3-10600 CL9 ECC DDR3 RDIMM 8GB PC3-8500 CL7 ECC DDR3 RDIMM 16GB PC3-8500 CL7 ECC DDR3 RDIMM IBM x3690 X5 Internal Memory Expansion IBM x3690 X5 QPI Scalability kit Xeon E6540 2.0GHz/18MB L3 / 6C Xeon X7550 2.0GHz/18MB L3 / 8C Xeon X7560 2.26GHz/24MB L3 / 8C	44T1592 44T1599 46C7482 46C7483 60Y0323 60Y0325 60Y0320 60Y0313 60Y0311 46M0829 46M0831 46M0832 46M0930 42D0707 43W7714 46M0902
Cooling fans	Five, hot-swappable system fans / one additional fan in each power supply / PFA / fan failure signals LED and IMM	IBM 675W Redundant Power Supply Kit IBM PCIe x16 Adapter 3/4 Video IBM PCIe x16 Adapter Full Video IBM PCIe 2 x8 Adapter kit IBM PCIe 3 x8 Riser card	60Y0327 60Y0331 60Y0337 60Y0329 60Y0366



- Front**
- Bay 0 2.5", SL 1", access, hot-swap, open
  - Bay 1 2.5", SL 1", access, hot-swap, open
  - 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, optional
  - Bay 5 2.5", SL 1", access, hot-swap, optional
  - Bay 6 2.5", SL 1", access, hot-swap, optional
  - Bay 7 2.5", SL 1", access, hot-swap, optional
  - Bay 8 2.5", SL 1", access, hot-swap, optional
  - Bay 9 2.5", SL 1", access, hot-swap, optional
  - Bay 10 2.5", SL 1", access, hot-swap, optional
  - Bay 11 2.5", SL 1", access, hot-swap, optional
  - Bay 12 2.5", SL 1", access, hot-swap, optional
  - Bay 13 2.5", SL 1", access, hot-swap, optional
  - Bay 14 2.5", SL 1", access, hot-swap, optional
  - Bay 15 2.5", SL 1", access, hot-swap, optional
  - Bay 16 5.25", 0.5", access, for optional optical



- Rear**
- Riser 1: A - Slot 1 - full-height, full-length, PCI-E x8  
B - Slot 2 - full-height, half-length, PCI-E x8
  - or  
Riser 1: A - Slot 1 - full-height, full-length, PCI-E x16 (optional)
  - Riser 2: C - Slot 3 - low profile, PCI-E x8  
D - Slot 4 - low profile, PCI-E x4(x8 mech)  
E - Slot 5 - low profile, PCI-E x8 (extended connector for Emulex 10Gb)

- Other options at [ibm.com/products/us/](http://ibm.com/products/us/)
- ↳ 2U Dimensions: H6.81" x W17.32" x D28.04"
- ↳ 2U Dimensions: H172.8mm x W440mm x D712.1mm
- ↳ Weight: 78 to 110lbs; 35.4 to 49.9kg
- ↳ 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
- ↳ 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, and fans with IBM Director

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

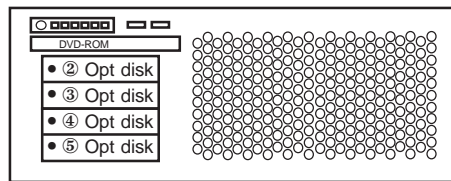
- ↳ **3 year parts and labor**
- ↳ **International Warranty Service<sup>3</sup>**
- ↳ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ↳ **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 24x7, 4 hr avg response 88Y8307
  - 3 year IOR 24x7, 2 hr avg response 88Y8308
  - 4 year IOR 9x5, NBD response 88Y8309
  - 5 year IOR 9x5, NBD response 88Y8313
- ↳ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↳ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

\*\*\*Full-length adapters cannot be used in conjunction with memory mezzanine (2DU)

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 <sup>4</sup> 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
8877-5RY	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	<b>Up to 4-way, high performance server with maximum memory availability and superior performance per watt</b>
Processors	Up to two AMD® Opteron 8000 Series Dual Core Processor up to 3.0GHz / simultaneously supports 32-bit and 64-bit computing
L2 cache	<b>1MB</b> / per core / at processor speed
Processor upgrade Implementation	<b>4-way SMP</b> / 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™	<b>1, 4 or 8GB</b> 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 / <b>Error Checking and Correcting (ECC)</b> via 16-bit Checksum / <b>Xcelerated Memory Technology™ / Chipkill™</b> on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing
SAS disk controller	<b>Adaptec® AIC-9580W</b> SAS controller (3Gb/sec) / dual channel / four port / on planar / PCI-Express / <b>RAID 0, 1 &amp; 10</b> / 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	<b>Four 3.5"</b> hot-swap bays / converged tray / SAS connectors
Mechanical	<b>EIA 19" Rack (4U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Chipset	<b>ServerWorks™ Chipset</b> / Two HT2100 PCI-Express Host Bridges / <b>HT2100A</b> 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 / <b>HT2100B</b> provides: one PCI-Express x16 slot and one PCI-Express x8 slot / <b>HT1000 South Bridge</b> provides: two PCI-X 1.0 slots at up to 64-bit/133MHz, USB(2.0), ATI video, IDE and LPC bus to NS PC87427 for Super I/O
Bus Slots	(See below) Four total PCI-Express / two PCI-X at up to 133 MHz / one HTx / one dedicated slot for optional RSA II daughter card
DVD-ROM / diskette Ethernet	8X <sup>6</sup> Slim DVD-ROM / none Dual Broadcom® 5708C 10/100/1000 ethernet controllers / on systemboard / two full gigabit ethernet MAC and PHY layer functions / PCI-Express / full duplex / Wake on LAN® / Alert Standard Format 2.0 / two RJ-45 ports in rear
Graphics controller Ports	XVGA / 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 / <b>Active Energy Manager™</b> , <b>Remote Supervisor Adapter II Slimline</b> optional (std on E4U) / PCI adaptor / 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	<b>Drop down Light Path Diagnostics</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director

Keyboard / mouse	None standard (because rack-based)	Dual Core AMD Opteron Processor Model 8212	40K1200
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	Dual Core AMD Opteron Processor Model 8214	40K1201
Cooling fans	<b>Calibrated Vectored Cooling™</b> 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 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		
	Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>		



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 300GB<sup>2</sup> hot-swap SAS disks

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

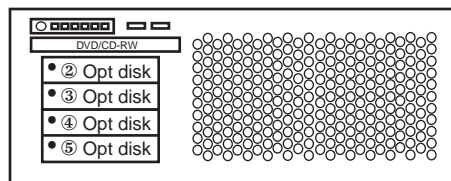
- ⊖ 3 year parts and labor
- ⊖ International Warranty Service<sup>3</sup>
- ⊖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⊖ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response 69P9507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

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 <sup>4</sup> 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	<b>Four socket, high performance server with maximum memory availability and superior performance per watt</b> Up to 4 x AMD® Opteron 8000 Series Six-Core Processors up to 2.6GHz <sup>1</sup> / simultaneously supports 32 and 64-bit computing <b>512KB</b> / per core / at processor speed <b>4-way SMP</b> / 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™	<b>8 or 12GB</b> 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 / <b>Error Checking and Correcting (ECC)</b> via 16-bit Checksum / <b>Xcelerated Memory Technology™</b> / <b>Chipkill™</b> on 1, 2 and 4GB DIMMs / online hot-spare memory / hardware scrubbing												
SAS disk controller	<b>Adaptec® AIC-9580W</b> SAS controller (3Gb/sec) / dual channel / four port / on planar / PCI-Express / <b>RAID 0, 1 &amp; 10</b> / 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	<b>Four 3.5"</b> hot-swap bays / converged tray / SAS connectors												
Mechanical	<b>EIA 19" Rack (4U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion												
Chipset	<b>ServerWorks™ Chipset</b> / Two HT2100 PCI-Express Host Bridges / <b>HT2100A</b> 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 / <b>HT2100B</b> provides: one PCI-Express x16 slot and one PCI-Express x8 slot / <b>HT1000 South Bridge</b> 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	24X-10x <sup>6</sup> Slim DVD/CD-RW / none												
Ethernet	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 / <b>Active Energy Manager™</b> / <b>Remote Supervisor Adapter II Slimline</b> 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	<b>Drop down Light Path Diagnostics</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running												
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director												
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	<b>Calibrated Vektored Cooling™</b> 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												

Six Core AMD Opteron Processor Model 8378	59Y3093
Six Core AMD Opteron Processor Model 8380	59Y3094
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](http://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 WARRANTY<sup>3</sup>**

- ⊖ 3 year parts and labor
- ⊖ International Warranty Service<sup>3</sup>
- ⊖ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⊖ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response ServicePac® 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>
- ⊖ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

**All models:** Maximum internal disk capacity: 1.2TB with four 300GB<sup>2</sup> hot-swap SAS disks

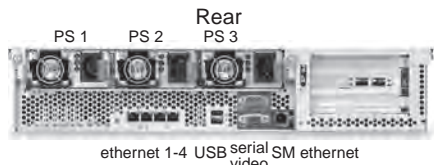
IBM® Type-model	Qty x Processor / Core	L3 cache	Watts	Memory	Disk / Bays	Storage Controller	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7164-22U	2 x Opteron™ 6128 2.0GHz/8C	12MB	115W	2x4GB	open / 8 hot-swap 3.5"	ServeRAID M1015	4x9	1 x 1100W	3	Sep 2010
7164-42U	2 x Opteron 6134 2.3GHz/8C	12MB	115W	2x4GB	open / 8 hot-swap 3.5"	ServeRAID M1015	4x9	1 x 1100W	3	Sep 2010
7164-62U	2 x Opteron 6172 2.1GHz/12C	12MB	115W	4x4GB	open / 8 hot-swap 3.5"	ServeRAID M1015	4x9	1 x 1100W	3	Sep 2010
7164-32U	4 x Opteron 6128HE 2.0GHz/12C	12MB	65W	4x4GB	open / 8 hot-swap 3.5"	ServeRAID M1015	4x9	2 x 1100W	3	Dec 2010
7164-52U	4 x Opteron 6136 2.2GHz/12C	12MB	80W	4x4GB	open / 8 hot-swap 3.5"	ServeRAID M1015	4x9	2 x 1100W	3	Dec 2010
7164-72U	4 x Opteron 6174 2.4GHz/12C	12MB	80W	4x4GB	open / 8 hot-swap 3.5"	ServeRAID M1015	4x9	2 x 1100W	3	Dec 2010

Processor(s) L3 cache SMP Implementation	Up to four AMD® Opteron 6100 Series Processors up to 2.3GHz <sup>1</sup> up to 12 Cores / supports 32 and 64-bit computing 12MB / on-die / shared <b>4-way SMP</b> / up to four Opteron Processors (same speed/cache size) Systemboard contains four G34 Sockets (LGA1944), thirty-two DIMM slots, three PCI-E slots, PCI-E SAS adapter slot, integrated SATA, ethernet and graphics controllers
Memory	8 or 16GB std / <b>64GB</b> max per processor(using 8GB DIMMs) / <b>PC3-10600 1333MHz LP 240-pin Registered ECC DDR3 SDRAM DIMMs</b> / thirty-two slots on systemboard / eight DIMMS per processor / Chipkill
Storage Controller	<b>IBM ServeRAID M1015</b> SAS/SATA controller / on riser card / PCI-E / supports <b>RAID-0/1/10</b> / hot-swap <b>IBM ServeRAID M5014</b> SAS/SATA controller / on riser card / PCI-E / supports <b>RAID-0/1/10/5/50</b> / hot-swap <b>IBM ServeRAID M5015</b> SAS/SATA controller / on riser card / PCI-E / supports <b>RAID-0/1/10/5/50</b> / hot-swap / battery backup
Disk bays	<b>3.5-inch: 8 std</b> / supports SAS and SATA HDD / hot-swap
Flash Storage	USB-based slot for optional Hypervisor USB key
Mechanical	<b>EIA 19" Rack (2U<sup>4</sup>)</b> / rack-mount only / supported in IBM NetBAY™ Rack products / no rack to tower conversion
Architecture/Chipset	<b>AMD Chipset</b> / SR5690 I/O Hub provides PCI-Express slots, links to BCM5709C controllers and interface to SP5100 South Bridge / SP5100 provides: USB, SATA, PCI and LPC bus to AST-2050 for video and limited Super I/O (See below) three second-generation PCI-Express x16/x8/x8(x4 electrical) slots / via riser
BUS slots	
Ethernet	<b>Quad Gigabit Ethernet ports</b> / dual Broadcom® 5709C controllers / four 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	Optional optical / USB only
Front & Rear ports	<i>Front:</i> two USB (Vers 2.0) <i>Rear:</i> two USB (Vers 2.0), serial (9-pin), graphics (DB-15), four ethernet (RJ-45), one RJ-45 (sys mgmt) / no parallel port
Graphics	SVGA / integrated in BMC on systemboard / 8MB SDRAM std/max / AST-2050
Systems Mgmt	Aspeed AST-2050 BMC Controller / integrated / provides system and environmental monitoring, event recording, alert capability / SOL / IPMI 2.0 / Remote Presence standard
Diagnostics Security	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

Cooling	<b>Calibrated Vectored Cooling™</b> / five-fan module / redundant / variable speed / PFA / one additional fan in each power supply	
Publications	<b>Installation Guide and Documentation CD</b>	
Keyboard / mouse	None standard (because rack-based) / USB only	
Power supply(s)	<i>Std/Max:</i> one/three 1100 watt hot-swap / rear access / auto restart / 2+1 redundant / auto-sensing	
Prerequisites	Monitor, keyboard, mouse, disk, rack, OS	Opteron 6128 2.0GHz / 8C / 12MB L3 Cache 49Y7350 Opteron 6134 2.3GHz / 8C / 12MB L3 Cache 49Y7353 Opteron 6172 2.1GHz / 12C / 12MB L3 Cache 49Y7354 2GB (1Rx8) PC3L-10600R ECC LP RDIMM 49Y1405 2GB (1Rx8) PC3-10600R-999 LP RDIMM 44T1592 4GB (2Rx4) PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM 49Y1435 4GB (1Rx4) PC3L-10600R ECC LP RDIMM 49Y1406 8GB (2Rx4) PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM 49Y1436 ServeRAID M5015 SAS/SATA controller 46M0829 ServeRAID M5014 SAS/SATA controller 46M0916 ServeRAID M5000 series advance feature key 46M0930 ServeRAID M5000 series battery kit 46M0917 IBM UltraSlim Enhanced SATA Multi-burner 46M0902 1100 Watt Hot-swap Power Supply Option (US) 49Y7342



- Bay 1 3.5", SL 1", access, hot-swap, open
- 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
- Bay 8 3.5", SL 1", access, hot-swap, open
- Bay 9 5.25", 0.5", access, opt DVD/CD-RW



- Available expansion slots:
- Slot 1 - fullsize, PCI-Express x16
  - Slot 2 - low-profile, PCI-Express x8
  - Slot 3 - low-profile, PCI-Express x8(x4 elec)
  - Slot 4 - SAS adapter slot, PCI-Express x8

- ⊞ Dimensions: H3.4" x W19" x D28.6"
- ⊞ Dimensions: H87mm x W482mm x D728
- ⊞ Weight: 48.6 to 72.7lbs; 22 to 33kg
- ⊞ Stealth black color
- ⊞ Tool-free serviceability
- ⊞ Access adapters, power supplies, processors, memory and systemboard from top
- ⊞ **Setup Program** by pressing F1 at startup
- ⊞ **Diagnostics** via preboot DSA by pressing F2 at startup
- ⊞ Drop Down Light Path Diagnostics for outside view of potential problem without removing cover
- ⊞ Information LED panel, diagnostic LED panel, and component LEDs give visual indications of system well-being
- ⊞ Predictive Failure Analysis® alerts on disks, power supplies, memory, processors, VRMs, and fans with IBM Director

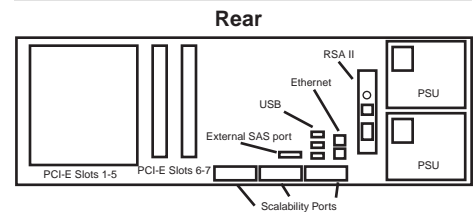
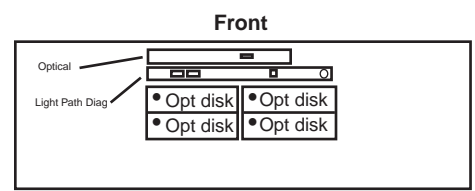
**LIMITED WARRANTY<sup>3</sup>**

- ⊞ 3 year parts and labor
- ⊞ International Warranty Service<sup>3</sup>
- ⊞ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⊞ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 2 year IOR 24x7, 4 hr avg response ServicePac® part number 91Y5332
  - 2 year IOR 24x7, 2 hr avg response ServicePac® part number 91Y5333
  - 2 year IOR 9x5, NBD response ServicePac® part number 91Y5330
  - 2 year IOR 9x5, NBD response ServicePac® part number 91Y5331
- ⊞ Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⊞ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM Memory slots	cards	RSA II	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7141-2RU	2 x Xeon™ MP E7320	2.13GHz	QC	2x2MB 4x1GB	16	Two	Std	SAS	4U <sup>4</sup> 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	<b>Two 64-bit Intel® Xeon™ Processor MP up to 2.4GHz<sup>1</sup>Dual-Core / up to 2.93GHz<sup>2</sup>Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T)</b>
L2 cache	<b>2 x 2, 3 or 4 MB / on-die / at processor speed</b>
Processor upgrade Implementation	<b>4-way SMP / up to four Xeon Processors MP (same speed/cache size)</b> 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™	<b>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™)</b>
SAS disk controller	<b>Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1</b> <b>Optional: ServeRAID™ 10k / RAID 5, 5E, 50 &amp; 6 / dedicated slot / dimm / battery backup</b>
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	<b>Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors</b>
Mechanical	<b>EIA 19" rack models (4U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks</b>
Chipset	<b>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)</b>
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 <sup>6</sup> CD-RW/DVD Combo optional / 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 / <b>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</b>
Diagnostics	<b>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</b>
Software	<b>ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director</b>

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 146GB<sup>2</sup> hot-swap SAS disks

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

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

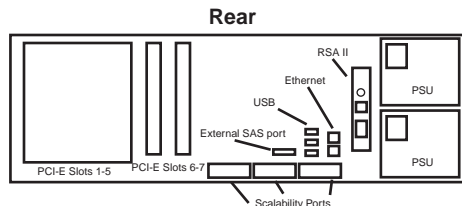
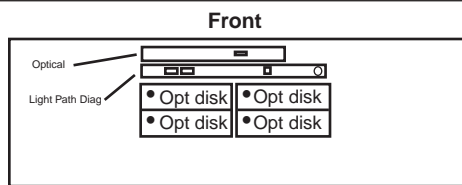
See footnotes for important warranty information

IBM® Type-model	Qty x Processor	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 <sup>4</sup> rack	7x5	1 x 1440W	3	Aug 2009
7141-2LU	1 x Xeon MP E7310	1.6GHz	2 2x2MB	2x2GB	8	One	Std	SAS	4U rack	7x5	1 x 1440W	3	Aug 2009

Processors	<b>Up to two 64-bit Intel® Xeon™ Processor MP up to 2.4GHz<sup>1</sup> Two-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T)</b>
L2 cache	<b>4 or 8MB</b> / on-die / at processor speed
Processor upgrade Implementation	<b>4-way SMP</b> / up to four Xeon Processors MP (same speed/cache size)
Active Memory™	<b>4GB</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> / <b>Memory ProteXion™</b> (redundant bit steering) and <b>Memory Mirroring™</b> and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)
SAS disk controller	<i>Std:</i> LSI® 1078 SAS Controller / <b>Serial Attached SCSI (SAS)</b> (3GB/sec) / PCI-E x8 / RAID 0,1 <i>Optional:</i> <b>ServeRAID™ 10k / RAID 5, 5E, 50 &amp; 6</b> / 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	<b>Four 2.5" hot-swap bays</b> / converged tray / 29-pin SAS connectors
Mechanical	<b>EIA 19" rack models (4U<sup>4</sup>)</b> x 28" deep / supported in NetBAY™ Racks
Chipset	<b>IBM X4™ 4th Generation chipset</b> / 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	optional / none std
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 / <b>PowerExecutive™</b> / <b>Remote Supervisor Adapter II Slimline</b> 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	<b>Light Path Diagnostics Card</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director

Keyboard / mouse	None standard (because rack-based)	2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB)	41Y2762
Power supplies	<i>Std/Max:</i> one/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 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/](http://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
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  - 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 300GB<sup>2</sup> hot-swap SAS disks

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

- ↳ **3 year parts and labor**
- ↳ **International Warranty Service<sup>3</sup>**
- ↳ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ↳ **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 24x7, 4 hr avg response**  
10N3059
  - 3 year IOR 24x7, 2 hr avg response**  
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  - 4 year IOR 9x5, NBD response**  
10N3061
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- ↳ **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- ↳ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

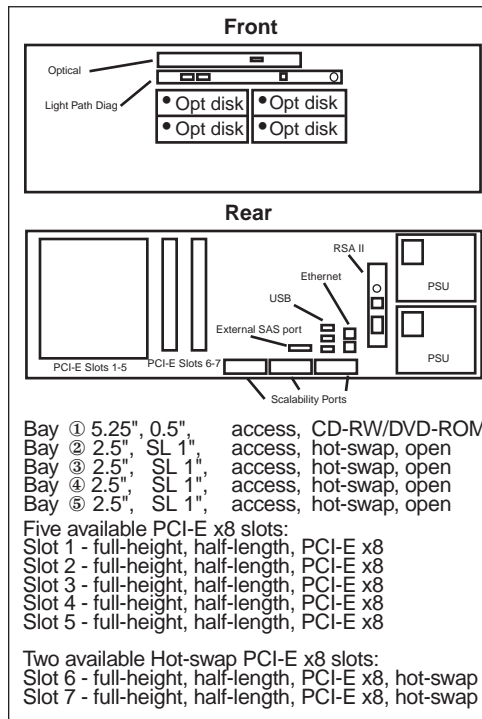


IBM® Type-model	Qty x Processor	Core	L2 cache	Memory	DIMM slots	Memory cards	RSA II	Disk controller	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7233-1LU	1 x Xeon™ MP E7420	2.13GHz	4	2x3MB	2x2GB	8	One	Std	SAS	4U <sup>4</sup> rack	7x5	1 x 1440W	3 Aug 2009
7233-2LU	2 x Xeon MP E7420	2.13GHz	4	2x3MB	4x2GB	16	Two	Std	SAS	4U rack	7x5	1 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	<b>Two 64-bit Intel® Xeon™ Processor MP up to 2.66GHz<sup>1</sup> Six-Core / up to 2.13GHz<sup>1</sup> Quad-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T)</b>
L2 cache	<b>6 or 9MB / on-die / at processor speed</b>
Processor upgrade Implementation	<b>4-way SMP / up to four Xeon Processors MP (same speed/cache size)</b>
Active Memory™	<b>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™)</b>
SAS disk controller	<b>Std: LSI® 1078 SAS Controller / Serial Attached SCSI (SAS) (3GB/sec) / PCI-E x8 / RAID 0,1</b> <b>Optional: ServeRAID™ 10k / RAID 5, 5E, 50 &amp; 6 / dedicated slot / dimm / battery backup</b>
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	<b>Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors</b>
Mechanical	<b>EIA 19" rack models (4U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks</b>
Chipset	<b>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)</b>
Slots	South Bridge provides: IDE, USB, bus for Super I/O, Dual Port Broadcom 5709C, RSA2(video) <b>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</b>
Optical / diskette	optional / none std
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	<b>Rear: RSA ethernet, RSA serial, three USB (2.0), DB-15 graphics, 4x SAS and two ethernet</b> <b>Front: two USB (2.0)</b>
Security	Power-on and administrator passwords / unattended boot / selectable boot
System management	BMC standard / IPMI 2.0 / <b>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</b>
Diagnostics	<b>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</b>
Software	<b>ServerGuide™ (CD-ROM installation and configuration utilities), IBM Director</b>

Keyboard / mouse	None standard (because rack-based)		
Power supplies	<b>Std/Max: one or two/two / 1440 watt (240 VAC) / rear access / hot-swap / redundant / worldwide / voltage-sensing / auto-restart / PFA</b>	2GB PC2-5300 CL5 ECC DDR2 RDIMM (2x1GB)	41Y2762
Cooling fans	<b>Six hot-swap, redundant, multi-speed fans / one additional fan in each power supply / PFA / fan failure signals Diagnostic LED and mgmt processor</b>	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		
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Other options at [ibm.com/products/us/](http://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
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**LIMITED WARRANTY<sup>3</sup>**

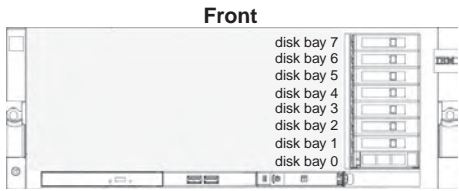
- ↪ **3 year parts and labor**
- ↪ **International Warranty Service<sup>3</sup>**
- ↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ↪ **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 24x7, 4 hr avg response 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>**
- ↪ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

**All models:** Maximum internal disk capacity: 1.2TB with four 300GB<sup>2</sup> hot-swap SAS disks

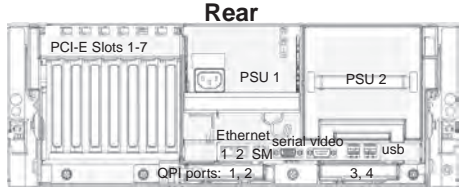
IBM® Type-model	Qty x Processor	Core	QPI	L3	Memory	DIMM slots	Memory cards	Ethernet	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7145-ARU	2 x Xeon™ E7520	1.86GHz	4	4.8GT/s	18MB	2x2GB	8	One	2 x 1Gb	4U <sup>4</sup> rack	7x9	1 x 1975W	3 Mar 2010
7145-1RU	2 x Xeon E7520	1.86GHz	4	4.8GT/s	18MB	4x4GB	16	Two	2 x 10Gb	4U rack	7x9	2 x 1975W	3 Mar 2010
7145-2RU	2 x Xeon E7530	1.86GHz	6	5.8GT/s	12MB	4x4GB	16	Two	2 x 10Gb	4U rack	7x9	2 x 1975W	3 Mar 2010
7145-3RU	2 x Xeon E7540	2.0GHz	6	6.4GT/s	18MB	4x4GB	16	Two	2 x 10Gb	4U rack	7x9	2 x 1975W	3 Mar 2010
7145-4RU	2 x Xeon X7550	2.0GHz	8	6.4GT/s	18MB	4x4GB	16	Two	2 x 10Gb	4U rack	7x9	2 x 1975W	3 Mar 2010
7145-5RU	2 x Xeon X7560	2.26GHz	8	6.4GT/s	24MB	4x4GB	16	Two	2 x 10Gb	4U rack	7x9	2 x 1975W	3 Mar 2010
7145-E4U	2 x Xeon X7550	2.0GHz	8	6.4GT/s	18MB	4x4GB	16	Two	2 x 10Gb	4U rack	7x9	2 x 1975W	3 Mar 2010

Processors	<b>Up to Four Next-Generation Intel® Xeon™ EX Processors featuring Quick Path Interconnect(QPI) technology at up to 2.26GHz<sup>1</sup> / up to Eight-Core / Hyper-Threading and Turbo</b> (excludes ARU and 1RU)
L3 cache	<b>12, 18 or 24MB</b> / on-die / shared
Processor upgrade Implementation	<b>4-way SMP</b> / up to four Xeon EX Processors (same speed/cache size) Systemboard contains four Socket-LS(1567-pin LGA) sockets, eight memory card slots, seven PCI-E slots, SAS adapter x8 slot, integrated 2 x 1Gb ethernet and graphics
Memory	<b>4 or 16GB std / PC3-10600 1066MHz LP 240-pin Registered ECC DIMMs</b> / one/two memory cards std / max: eight / 8 DIMM slots per memory card / 64 DIMMs max / DIMMs must be installed in matched pairs / Memory ProteXion™, Chipkill™, Memory Mirroring™ and sparing / dual Intel Scalable Memory Buffers per memory card
SAS/SATA disk controller	ServeRAID BR10i / LSI® 1068 / SAS / 3Gb / RAID 0/1 / PCI-E / dedicated slot / standard / upgradeable / ServeRAID M1015 / LSI SAS2008 / SAS / 6Gb / RAID 0/1/10 (optional 5/50) / ServeRAID M5015 / LSI SAS2108 / SAS / 6Gb / 512MB cache / RAID 0/1/10/5/50 (optional 6/60) / battery optional
SAS connectors	Controller wired to SAS backplane
Disk	Supports up to 4 std / 8 max - 2.5" SFF or 16 - 1.8" SSD disks / SAS / SATA / SSD / mixed use supported
Mechanical	<b>EIA 19" rack models (4U<sup>4</sup>)</b> x 28" deep / supported in NetBAY™ Racks
Scalability	Scalable to eight-socket, 128 DIMM, 8U <sup>4</sup> form factor, two-node via QPI links
Chipset	<b>Intel 7500 chipset</b> / dual IO Hubs provide PCI-E slots, links to BCM5709C and interface to ICH10 Southbridge / ICH10 provides: USB, SATA for DVD and LPC bus to IMM for video and limited Super I/O
Slots	Seven PCI-E slots (see below)
Optical / diskette	Optional / 24x/8x <sup>6</sup> CD-RW/DVD Combo / SATA / none
Ethernet	Broadcom® 5709C 10/100/1000 dual-port ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 / TOE / standard / Emulex® 10Gb Virtual Fabric adapter standard on most(except ARU) / consumes PCI-E slot 7
Ports	<i>Rear:</i> four QPI, one sys mgmt ethernet, one serial, four USB(2.0), DB-15 graphics and two ethernet / <i>Front:</i> two USB (2.0)
Graphics	SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max
Systems Management	<b>Integrated Management Module (IMM)</b> / 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 standard
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Publications	<b>Installation Guide and Documentation CD</b>
Diagnostics	<b>Light Path Diagnostics Card</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based) / USB only

Power supplies	<i>Std/Max:</i> one or two/two / rear access / hot-swap / worldwide / voltage-sensing / auto-restart / PFA / 1975W(240V)/redundant / 875W(110V)/non-redundant	1GB PC3-10600 CL4 ECC DDR3 RDIMM 2GB PC3-10600 CL4 ECC DDR3 RDIMM 4GB PC3-8500 CL5 ECC DDR3 RDIMM 8GB PC3-8500 CL5 ECC DDR3 RDIMM 16GB PC3-8500 CL5 ECC DDR3 RDIMM	44T1480 44T1481 46C7448 46C7482 46C7483
Cooling fans	Six variable-speed system fans / includes one fan in each power supply / PFA / fan failure signals LED and IMM / hot-swap (except for lower, center fan-pack on 2 node)	IBM Memory Expansion Card Xeon E7520 1.86GHz/18MB L3 / 4C Xeon E7530 1.86GHz/12MB L3 / 6C Xeon E7540 2.0GHz/18MB L3 / 6C Xeon X7550 2.0GHz/18MB L3 / 8C Xeon X7560 2.26GHz/24MB L3 / 8C	46M0071 49Y4306 49Y4305 49Y4304 49Y4302 49Y4300



- Bay 0 2.5", SL 1", access, hot-swap, open
- Bay 1 2.5", SL 1", access, hot-swap, open
- 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, optional
- Bay 5 2.5", SL 1", access, hot-swap, optional
- Bay 6 2.5", SL 1", access, hot-swap, optional
- Bay 7 2.5", SL 1", access, hot-swap, optional
- Bay 8 5.25", 0.5", access, for optional optical



- Slot 1 - full-height, full-length, PCI-E x16
- Slot 2 - full-height, full-length, PCI-E x8(x4 elec)
- Slot 3 - full-height, full-length, PCI-E x8
- Slot 4 - full-height, full-length, PCI-E x8
- Slot 5 - full-height, half-length, PCI-E x8
- Slot 6 - full-height, half-length, PCI-E x8
- Slot 7 - full-height, half-length, PCI-E x8

- ⊕ Dimensions: H6.81" x W17.32" x D28.04"
- ⊕ Dimensions: H173mm x W440mm x D712mm
- ⊕ Weight: 77.8 to 110lbs; 35.3 to 49.9kg
- ⊕ 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
- ⊕ 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

Maximum internal disk capacity:  
2TB with four 500GB<sup>2</sup> SFF SATA disks,  
4TB with eight 500GB<sup>2</sup> SFF SATA disks

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

- ⊕ **3 year parts and labor**
- ⊕ **International Warranty Service<sup>3</sup>**
- ⊕ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ⊕ **On site service upgrade options (in eligible locations):<sup>7</sup>**
- 3 year IOR 24x7, 4 hr avg response 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>**
- ⊕ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

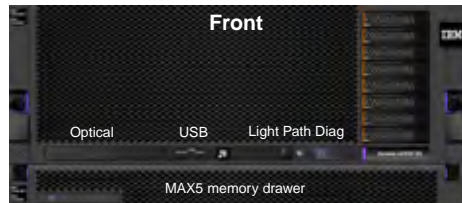
See footnotes for important warranty information

\*\*\* except for lower, center fan-pack on 2-node

IBM® Type-model	Qty x Processor	Core	QPI	L3	Memory	DIMM slots	Memory cards	Ethernet	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7145-2SU	4 x Xeon™ E7530	1.86GHz	6	5.8GT/s	12MB	10x4GB	32+32	Four	2 x 10Gb	5U <sup>4</sup> rack	7x9	2 x 1975W	3 June 2010
7145-4SU	4 x Xeon X7550	2.0GHz	8	6.4GT/s	18MB	10x4GB	32+32	Four	2 x 10Gb	5U rack	7x9	2 x 1975W	3 June 2010
7145-5SU	4 x Xeon X7560	2.26GHz	8	6.4GT/s	24MB	10x4GB	32+32	Four	2 x 10Gb	5U rack	7x9	2 x 1975W	3 June 2010

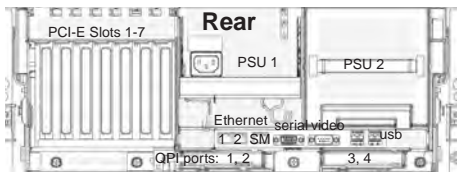
Processors	<p><b>Four Next-Generation Intel® Xeon™ EX Processors featuring Quick Path Interconnect(QPI) technology at up to 2.26GHz<sup>1</sup> / up to Eight-Core / Hyper-Threading and Turbo</b></p> <p>12, 18 or 24MB / on-die / shared</p> <p>4-way SMP / four Xeon EX Processors (same speed/cache size)</p> <p>Systemboard contains four Socket-LS(1567-pin LGA) sockets, eight memory card slots, seven PCI-E slots, SAS adapter x8 slot, integrated 2 x 1Gb ethernet and graphics</p>
L3 cache	
Processor upgrade Implementation	
Memory	<p><b>40GB std / PC3-10600 1066MHz LP 240-pin Registered ECC DIMMs / four memory cards std / max: eight / 8 DIMM slots per memory card / 32/64 DIMMS std/max on base system / DIMMs must be installed in matched pairs / Memory ProteXion™, Chipkill™, Memory Mirroring™ and sparing / dual Intel Scalable Memory Buffers per memory card / 32 DIMM / 1U / tool-free / memory expansion drawer / std on 2S, 4S and 5S / system max of 96 DIMM slots / 2x4GB std</b></p>
MAX5	
SAS/SATA disk controller	<p>ServerRAID BR10i / LSI® 1068 / SAS / 3Gb / RAID 0/1 / PCI-E / dedicated slot / standard / upgradeable / ServeRAID M1015 / LSI SAS2008 / SAS / 6Gb / RAID 0/1/10 (optional 5/50) / ServeRAID M5015 / LSI SAS2108 / SAS / 6Gb / 512MB cache / RAID 0/1/10/5/50 (optional 6/60) / battery optional</p>
SAS connectors	Controller wired to SAS backplane
Disk	Supports up to 4 std / 8 max - 2.5" SFF or 16 - 1.8" SSD disks / SAS / SATA / SSD / mixed use supported
Mechanical	<b>EIA 19" rack models (5U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks</b>
Chipset	<p><b>Intel 7500 chipset</b> / dual IO Hubs provide PCI-E slots, links to BCM5709C and interface to ICH10 Southbridge / ICH10 provides: USB, SATA for DVD and LPC bus to IMM for video and limited Super I/O</p> <p>Seven PCI-E slots (see below)</p> <p>Optional / 24x/8x<sup>6</sup> CD-RW/DVD Combo / SATA / none</p> <p>Broadcom® 5709C 10/100/1000 dual-port ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 / TOE / standard / Emulex® 10Gb Virtual Fabric adapter standard on most(except ARU) / consumes PCI-E slot 7</p> <p>Rear: four QPI, one sys mgmt ethernet, one serial, four USB(2.0), DB-15 graphics and two ethernet / Front: two USB (2.0)</p>
Slots	
Optical / diskette	
Ethernet	
Ports	
Graphics	SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max
Systems Management	<p><b>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 standard</b></p> <p><b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics</p> <p>Power-on password / administrator password / unattended boot / selectable boot / unattended start mode</p>
Diagnostics	
Security	
Publications	<p><b>Installation Guide and Documentation CD</b></p> <p><b>Light Path Diagnostics Card</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running</p>
Diagnostics	
Software	<p><b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director</p> <p>None standard (because rack-based) / USB only</p>
Keyboard / mouse	

Power supplies	<p>Std/Max: one or two/two / rear access / hot-swap / worldwide / voltage-sensing / auto-restart / PFA / 1975W(240V)/redundant / 875W(110V)/non-redundant</p>	<p>1GB PC3-10600 CL4 ECC DDR3 RDIMM 44T1480</p> <p>2GB PC3-10600 CL4 ECC DDR3 RDIMM 44T1481</p> <p>4GB PC3-8500 CL5 ECC DDR3 RDIMM 46C7448</p> <p>8GB PC3-8500 CL5 ECC DDR3 RDIMM 46C7482</p> <p>16GB PC3-8500 CL5 ECC DDR3 RDIMM 46C7483</p> <p>IBM Memory Expansion Card 46M0071</p> <p>Xeon E7520 1.86GHz/18MB L3 / 4C 49Y4306</p> <p>Xeon E7530 1.86GHz/12MB L3 / 6C 49Y4305</p> <p>Xeon E7540 2.0GHz/18MB L3 / 6C 49Y4304</p> <p>Xeon X7550 2.0GHz/18MB L3 / 8C 49Y4302</p> <p>Xeon X7560 2.26GHz/24MB L3 / 8C 49Y4300</p> <p>IBM ServeRAID-M5015 SAS/SATA Controller 46M0829</p> <p>IBM ServeRAID-M1015 SAS/SATA Controller 46M0831</p> <p>IBM ServeRAID-M1000 Series Advance Feature Key 46M0832</p> <p>IBM ServeRAID-M5000 Series Advance Feature Key 46M0930</p> <p>IBM 500GB GB 7200 2.5" SAS Hot-swap HDD 42D0707</p> <p>IBM 50GB 2.5" SFF SSD 43W7714</p> <p>IBM UltraSlim Enhanced SATA Multi-burner 46M0902</p> <p>Other options at <a href="http://ibm.com/products/us/">ibm.com/products/us/</a></p>
Cooling fans	Six variable-speed system fans / includes one fan in each power supply / PFA / fan failure signals LED and IMM / hot-swap	



disk bay 7  
disk bay 6  
disk bay 5  
disk bay 4  
disk bay 3  
disk bay 2  
disk bay 1  
disk bay 0

- Bay 0 2.5", SL 1", access, hot-swap, open
- Bay 1 2.5", SL 1", access, hot-swap, open
- 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, optional
- Bay 5 2.5", SL 1", access, hot-swap, optional
- Bay 6 2.5", SL 1", access, hot-swap, optional
- Bay 7 2.5", SL 1", access, hot-swap, optional
- Bay 8 5.25", 0.5", access, for optional optical



- Slot 1 - full-height, full-length, PCI-E x16
  - Slot 2 - full-height, full-length, PCI-E x8(x4 elec)
  - Slot 3 - full-height, full-length, PCI-E x8
  - Slot 4 - full-height, full-length, PCI-E x8
  - Slot 5 - full-height, half-length, PCI-E x8
  - Slot 6 - full-height, half-length, PCI-E x8
  - Slot 7 - full-height, half-length, PCI-E x8
- (extended connector for Emulex 10Gb)

- 4U dimensions: H6.81" x W17.32" x D28.04"
- 4U dimensions: H173mm x W440mm x D712mm
- 4U weight: 77.8 to 110lbs; 35.3 to 49.9kg
- 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
- 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

Maximum internal disk capacity:  
2TB with four 500GB<sup>2</sup> SFF SATA disks,  
4TB with eight 500GB<sup>2</sup> SFF SATA disks

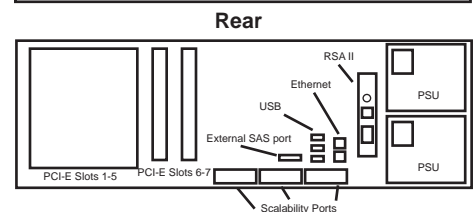
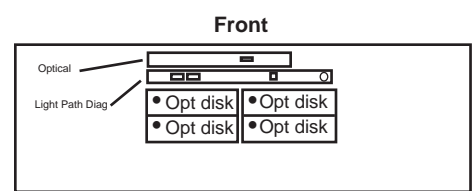
**LIMITED WARRANTY<sup>3</sup>**

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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 <sup>4</sup> 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	<b>Two 64-bit Intel® Xeon™ MP Processors up to 2.66GHz<sup>1</sup> Six-Core / up to 2.4GHz<sup>2</sup> Four-Core / All 1066MHz FSB / Extended Memory 64 Technology™ (EM64T)</b>
L2 cache	<b>6 or 9MB</b> std / on-die / at processor speed
Processor upgrade Implementation	<b>4-way SMP</b> / 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™	<b>8 or 16GB</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> / <b>Memory ProteXion™</b> (redundant bit steering) and <b>Memory Mirroring™</b> and Hot-swap (non-OS specific) / Hot-add (supported only with Microsoft® Windows™ Server 2003™)
SAS disk controller	Std: LSI® 1078 SAS Controller / <b>Serial Attached SCSI (SAS)</b> (3GB/sec) / PCI-E x8 / RAID 0,1 Optional: <b>ServeRAID™ 10k / RAID 5, 5E, 50 &amp; 6</b> / 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	<b>Four 2.5" hot-swap bays / converged tray / 29-pin SAS connectors</b>
Mechanical	<b>EIA 19" rack models (4U<sup>4</sup>) x 28" deep</b> / supported in NetBAY™ Racks
Chipset	<b>IBM X4™ 4th Generation chipset</b> / 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 <sup>6</sup> 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 / <b>PowerExecutive™</b> / <b>Remote Supervisor Adapter II Slimline</b> 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	<b>Light Path Diagnostics Card</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director

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 <a href="http://ibm.com/products/us/">ibm.com/products/us/</a>	



- Bay ① 5.25", 0.5" access, CD-RW/DVD-ROM
  - Bay ② 2.5", SL 1<sup>h</sup> access, hot-swap, open
  - Bay ③ 2.5", SL 1<sup>h</sup> access, hot-swap, open
  - Bay ④ 2.5", SL 1<sup>h</sup> access, hot-swap, open
  - Bay ⑤ 2.5", SL 1<sup>h</sup> 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 300GB<sup>2</sup> hot-swap SAS disks

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

- ↳ **3 year parts and labor**
- ↳ **International Warranty Service<sup>3</sup>**
- ↳ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ↳ **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 24x7, 4 hr avg response** 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>**
- ↳ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

See footnotes for important warranty information

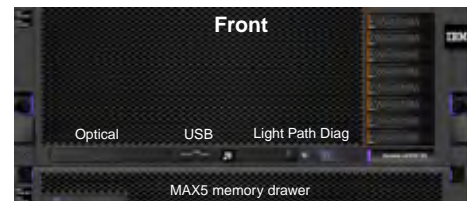
# IBM System x3950 X5 with MAX5

xREF by STG Field Skills and Education Team

IBM® Type-model	Qty x Processor	Core	QPI	L3	Memory	DIMM slots	Memory cards	Ethernet	Mechanical	Slots x bays	Hot-swap pwr supplies	Warranty (yrs.)	Available date
7145-4DU	4 x Xeon™ X7550	2.0GHz	8	6.4GT/s	18MB	64x4GB	64+32	Eight	2 x 10Gb	5U <sup>4</sup> rack	7x9	2 x 1975W	3 Sep 2010

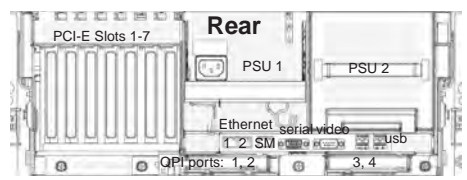
Processors	<b>Four Next-Generation Intel® Xeon™ EX Processors featuring Quick Path Interconnect(QPI) technology at 2.0GHz/ Eight-Core / Hyper-Threading and Turbo</b>
L3 cache	<b>18MB / on-die / shared</b>
Processor upgrade Implementation	<b>4-way SMP / four Xeon EX Processors (same speed/cache size)</b> Systemboard contains four Socket-LS(1567-pin LGA) sockets, eight memory card slots, seven PCI-E slots, SAS adapter x8 slot, integrated 2 x 1Gb ethernet and graphics
Memory	<b>256GB std / PC3-10600 1066MHz LP 240-pin Registered ECC DIMMs / eight memory cards std/max / 8 DIMM slots per memory card / 64 DIMMs std/max on base system / DIMMs must be installed in matched pairs / Memory ProteXion™, Chipkill™, Memory Mirroring™ and sparing / dual Intel Scalable Memory Buffers per memory card / 128GB std / 32 x 4GB DIMMs / 1U / tool-free / memory expansion drawer / std / system max of 96 DIMM slots</b>
MAX5	
SAS/SATA disk controller	ServerRAID BR10i / LSI® 1068 / SAS / 3Gb / RAID 0/1 / PCI-E / dedicated slot / standard / upgradeable / ServeRAID M1015 / LSI SAS2008 / SAS / 6Gb / RAID 0/1/10 (optional 5/50) / ServeRAID M5015 / LSI SAS2108 / SAS / 6Gb / 512MB cache / RAID 0/1/10/5/50 (optional 6/60) / battery optional
SAS connectors	Controller wired to SAS backplane
Disk	Supports up to 4 std / 8 max - 2.5" SFF or 16 - 1.8" SSD disks / SAS / SATA / SSD / mixed use supported
Mechanical	<b>EIA 19" rack models (5U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks</b>
Chipset	<b>Intel 7500 chipset</b> / dual IO Hubs provide PCI-E slots, links to BCM5709C and interface to ICH10 Southbridge / ICH10 provides: USB, SATA for DVD and LPC bus to IMM for video and limited Super I/O
Slots	Seven PCI-E slots (see below)
Optical / diskette	Optional / 24x/8x <sup>6</sup> CD-RW/DVD Combo / SATA / none
Ethernet	Broadcom® 5709C 10/100/1000 dual-port ethernet / on systemboard / PCI-E x4 / Wake on LAN® / Alert on LAN™ 2 / TOE / standard / Emulex® 10Gb Virtual Fabric adapter standard on most(except ARU) / consumes PCI-E slot 7
Ports	<i>Rear:</i> four QPI, one sys mgmt ethernet, one serial, four USB(2.0), DB-15 graphics and two ethernet / <i>Front:</i> two USB (2.0)
Graphics	SVGA / Matrox G200eV integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max
Systems Management	<b>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 standard</b>
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode
Publications	<b>Installation Guide and Documentation CD</b>
Diagnostics	<b>Light Path Diagnostics Card</b> / primary indicator on information panel with LEDs associated with failing components / IBM Real Time Diagnostics (operated through IBM Director) available even while server running
Software	<b>ServerGuide™</b> (CD-ROM installation and configuration utilities), IBM Director
Keyboard / mouse	None standard (because rack-based) / USB only

Power supplies	<i>Std/Max:</i> one or two/two / rear access / hot-swap / worldwide / voltage-sensing / auto-restart / PFA / 1975W(240V)/redundant / 875W(110V)/non-redundant	1GB PC3-10600 CL4 ECC DDR3 RDIMM 2GB PC3-10600 CL4 ECC DDR3 RDIMM 4GB PC3-8500 CL5 ECC DDR3 RDIMM 8GB PC3-8500 CL5 ECC DDR3 RDIMM 16GB PC3-8500 CL5 ECC DDR3 RDIMM IBM Memory Expansion Card Xeon E7520 1.86GHz/18MB L3 / 4C Xeon E7530 1.86GHz/12MB L3 / 6C Xeon E7540 2.0GHz/18MB L3 / 6C Xeon X7550 2.0GHz/18MB L3 / 8C Xeon X7560 2.26GHz/24MB L3 / 8C	44T1480 44T1481 46C7448 46C7482 46C7483 46M0071 49Y4306 49Y4305 49Y4304 49Y4302 49Y4300
Cooling fans	Six variable-speed system fans / includes one fan in each power supply / PFA / fan failure signals LED and IMM / hot-swap	IBM ServeRAID-M5015 SAS/SATA Controller IBM ServeRAID-M1015 SAS/SATA Controller IBM ServeRAID-M1000 Series Advance Feature Key IBM ServeRAID-M5000 Series Advance Feature Key IBM 500GB GB 7200 2.5" SAS Hot-swap HDD IBM 50GB 2.5" SFF SSD IBM UltraSlim Enhanced SATA Multi-burner	46M0829 46M0831 46M0832 46M0930 42D0707 43W7714 46M0902



disk bay 7  
disk bay 6  
disk bay 5  
disk bay 4  
disk bay 3  
disk bay 2  
disk bay 1  
disk bay 0

- Bay 0 2.5", SL 1", access, hot-swap, open
- Bay 1 2.5", SL 1", access, hot-swap, open
- 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, optional
- Bay 5 2.5", SL 1", access, hot-swap, optional
- Bay 6 2.5", SL 1", access, hot-swap, optional
- Bay 7 2.5", SL 1", access, hot-swap, optional
- Bay 8 5.25", 0.5", access, for optional optical



- Slot 1 - full-height, full-length, PCI-E x16
  - Slot 2 - full-height, full-length, PCI-E x8(x4 elec)
  - Slot 3 - full-height, full-length, PCI-E x8
  - Slot 4 - full-height, full-length, PCI-E x8
  - Slot 5 - full-height, half-length, PCI-E x8
  - Slot 6 - full-height, half-length, PCI-E x8
  - Slot 7 - full-height, half-length, PCI-E x8
- (extended connector for Emulex 10Gb)

- 4U dimensions: H6.81" x W17.32" x D28.04"
- 4U dimensions: H173mm x W440mm x D712mm
- 4U weight: 77.8 to 110lbs; 35.3 to 49.9kg
- 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
- 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

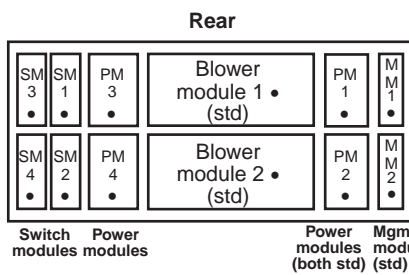
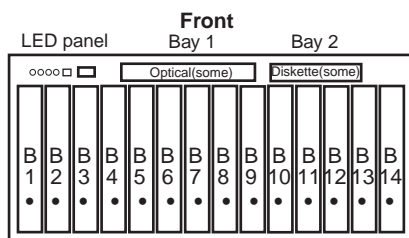
Maximum internal disk capacity:  
2TB with four 500GB<sup>2</sup> SFF SATA disks,  
4TB with eight 500GB<sup>2</sup> SFF SATA disks

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

- **3 year parts and labor**
- **International Warranty Service<sup>3</sup>**
- **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 24x7, 4 hr avg response**  
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>**
- **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

See footnotes for important warranty information

IBM® Type-model	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	
8677-3SX**	HC10/HS12/HS20/HS21/HS21XM/HS22/HS22V/HS40/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 <sup>4</sup> rack	Mar 2009	
8677-4SX	HC10/HS12/HS20/HS21/HS21XM/HS22/HS22V/HX5/HS40/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	
8677-3TX**	HC10/HS12/HS20/HS21/HS21XM/HS22/HS22V/HS40/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	Apr 2010	
8677-4TX	HC10/HS12/HS20/HS21/HS21XM/HS22/HS22V/HS40/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	Apr 2010	
Positioning Description	<b>Flexible, innovative design provides investment protection and reduces deployment costs</b> 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	<b>EIA 19" rack models (7U<sup>4</sup>) x 28" deep / supported in NetBAY™ Racks</b>										
DVD / diskette / USB	<b>3SX &amp; 4SX:</b> CD/DVD-RW Multiburner / <b>3TX &amp; 4TX:</b> optical optional / 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 <a href="http://ibm.com/products/us">ibm.com/products/us</a>		



- 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 WARRANTY<sup>3</sup>**

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 4 hr avg response (ServicePac 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>
- 24x7<sup>12</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Advanced Management modules std / max	Power modules std / max	Power Module Wattage	Blower modules std / max	Mechanical	Available date
8852-4Sx	HX5/HC10/HS12/HS20/HS21/HS21XM/HS22/HS22V/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/QS21/QS22	0/14**	0/4	1/2	2/4	2900W	2/2	9U <sup>4</sup> rack	Aug 2009
8852-4Tx	HX5/HC10/HS12/HS20/HS21/HS21XM/HS22/HS22V/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/QS21/QS22	0/14	0/4	1/2	2/4	2980W	2/2	9U <sup>4</sup> rack	Aug 2010
Positioning Description	<b>Revolutionary design provides the most efficient infrastructure building block for adding scale and capacity</b> 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	<b>Supports all blades</b> 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 / 4Sx: 2900W at 220V / 4Tx: 2980W 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	<b>EIA 19" rack models (9U<sup>4</sup>) x 29" deep</b> / supported in NetBAY™ Racks (such as NetBAY42 ER)								
Media Tray	<b>4Sx/4Tx:</b> Two USB ports / 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 / Remote Deployment Manager								
System LED panel	Provides power-on, location, over-temperature, information, and system-error conditions								

1U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17231UX	BladeCenter H 2900W Power Module pair with Fan Packs	31R3335
2U 17" Flat Panel Monitor Console Kit (with kybd/monitor)	17232UX	BladeCenter H 2980W Power Module pair with Fan Packs	68Y6601
NetBAY ACT Local Console Manager (CAT5 KVM cabling)	1735L04	BladeCenter H Enhanced Cooling Upgrade	68Y6650
NetBAY ACT Remote Console Manager (CAT5 KVM cabling)	1735R16	IBM Advanced Management Module	25R5778
NetBAY ACT 250mm KVM Conversion Option	32P1636	BladeCenter H Double 30A NEMA L6-30P (208V) 4.3M	25R5783
NetBAY ACT 1.5m KVM Conversion Option	32P1652	BladeCenter H Dual 32A IEC 309 P+N+G/16A IEC 320-C20 (230V) 4.3M	25R5784
Cisco Systems Fiber Intelligent Gigabit Ethernet Switch Module	32R1888	BladeCenter H Triple 16A IEC 320-C20 (200-240V) 2.8M	25R5785
Cisco Systems Gigabit Ethernet Switch Module	32R1892	BladeCenter H Double 30A KSC 8305 (220V) 4.3M (Korea)	25R5811
Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module	32R1859	BladeCenter H Dual 32A AS/NZS 3112/16A IEC320-C20 (ANZ)	25R5812
Brocade 10 port 4Gb SAN Switch Module	32R1813	BladeCenter H Serial Port Breakout Cable	25R5806
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	Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a> 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)**

\*\*Limitations  
4Sx: 130W HS22/HS22V models up to 12 blades with enhanced cooling upgrade and 2900W power supply; up to 14 blades with enhanced cooling upgrade and upgraded 2980W power supply

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

- ↪ **3 year parts and labor**
- ↪ **International Warranty Service<sup>3</sup>**
- ↪ **On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>**
- ↪ **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 3 year IOR 24x7, 2 hr avg response** (ServicePac® part num 21P2065)
  - 3 year IOR 24x7, 4 hr avg response** (ServicePac part num 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>**
- ↪ **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

IBM® Type-model	Supported Blades	Blade Servers std/max	Switch modules std/max	Switch modules (type)	Storage modules std/max	Advanced Mgmt modules std/max	Power modules std/max	Power Module Wattage	Blower modules std/max	Mechanical	Available date
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 <sup>4</sup> rack	Aug 2009
8886-ETX <sup>1</sup>	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 rack	Aug 2009
8886-EVX <sup>1</sup>	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 rack	Aug 2009

Positioning Description	<b>Greatly Improved BladeCenter Platform for Small Office Environment with Integrated Storage</b> 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 Switch modules Storage modules	<b>Supports all blades</b> and Blade Expansion Units / 6 hot-swappable bays / front access <i>Std/max:</i> none/ten / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru <i>Std:</i> some: one; some: none; <i>max:</i> 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	<i>Std/max:</i> 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	<i>Std:</i> two; <i>max:</i> 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	<i>Std/max:</i> four / hot-swap / redundant / variable speed / rear access / front to back airflow		
Mechanical Media Tray	<b>EIA 19" rack models (7U<sup>4</sup>)</b> x 29" deep / supported in NetBAY™ Racks (such as NetBAY42 ER) <b>TX, ETX&amp;EVX:</b> 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	<i>Rear:</i> two USB, two RJ45 (one ethernet and one serial), analog DB-15 graphics (on advanced mgmt module) / one serial aggregate for break out cable; <i>Front:</i> 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 Systems management	Dual integrated gigabit ethernet controllers on each blade connects to optional <b>GB Ethernet Switch Module</b> 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	Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	
IBM Server 73GB 15K SAS HS	43W7523	Solutions available from IBM BladeCenter Alliance program partners	
IBM Server 146GB 15K SAS HS	43W7524		
300GB SAS 15K HS	43X0802		
500GB SATA2 HDD	39M4558		

**Front**

Disk Storage Module bays

Media Tray

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

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

See footnotes for important warranty information

<sup>1</sup> 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 <sup>4</sup> 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	<b>Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments</b> 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	<b>Supports all blades</b> 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	<b>EIA 19" rack models (8U<sup>4</sup>) x 20"</b> deep / designed for EIA-310D and UTF Four Post Racks 24X-10X-24X-8X <sup>6</sup> Combo / Two USB port (Version 1.1) / all USB interface (types A & C) / front access / shared by up to eight blade servers / requests for optical cd and USB port(s) by pressing CD select button on server blade front panel									
Keyboard / mouse	None standard / provides KVM console support / requests for keyboard, mouse, and video by pressing the display button on server blade front panel									
Ports	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 <b>4-port GB Ethernet Switch Module</b>									
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](http://ibm.com/pc/us/accessories)  
• Solutions available from IBM BladeCenter Alliance program partners

**Front**

**Rear**

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

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

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

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

IBM® Type-model	Supported Blades	Blade 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 <sup>4</sup> 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	<b>Flexible, innovative design provides investment protection and reduces deployment costs for NEBS environments</b> 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	<b>Supports all blades</b> 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	<b>EIA 19" rack models (8U<sup>4</sup>) x 20" deep</b> / designed for EIA-310D (types A & C) and UTF four post racks 24X-10X-24X-8X <sup>6</sup> Combo / Two USB port (Version 1.1) / all USB interface / front access / shared by up to eight blade servers / requests for keyboard, mouse, and video by pressing the display 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](http://ibm.com/products/us)  
• Solutions available from IBM BladeCenter Alliance program partners

**Front**

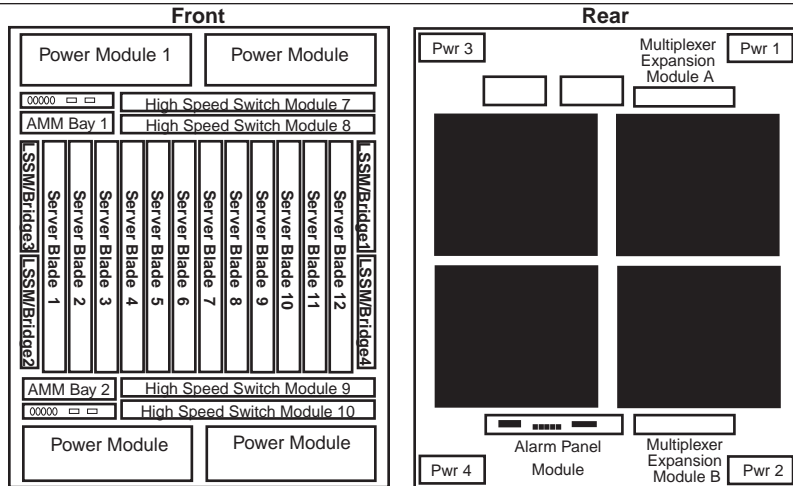
**Rear**

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 WARRANTY<sup>3</sup>**

- ↔ 3 year parts and labor
- ↔ International Warranty Service<sup>3</sup>
- ↔ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↔ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9205)
- Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ↔ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Advanced Management modules std / max	Power modules std / max	Power module Wattage	Fan modules std / max	Mechanical	Available date
8740-1RX	HS12/HS20/HS21**/HS21XM**/HS22/HS22V/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/PN41/QS21/QS22	0 / 12	0 / 8	1 / 2	2 / 4	2535W (DC -48V)	4 / 4	12U <sup>4</sup> rack	Jun 2007
8740-2RX	HS12/HS20/HS21**/HS21XM**/HS22/HS22V/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/PN41/QS21/QS22	0 / 12	0 / 8	2 / 2	4 / 4	2535W (DC -48V)	4 / 4	12U <sup>4</sup> rack	Oct 2010
Positioning Description	<b>Leadership High Speed, High Performance, carrier grade blade platform for Network applications</b> 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	<b>Supports all blades</b> and Blade Expansion Units / 12 hot-swappable bays / front access								
Switch modules	Std/max: none/eight / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru								
Advanced Management Modules	Std/max: 1Rx: one/two; 2Rx: two/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 / 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								
Blower modules	Std/max: four / hot-swap / redundant / speed controlled according to ambient air temperature / rear access / front to back airflow								
Mechanical	<b>EIA 19" rack models (12U<sup>4</sup>)</b> x 706mm deep / supported in NetBAY™ Racks with seismic bracing								
Media Tray	Std/max: 1Rx: one/two; 2Rx: two/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 / supports NetBAY ACT CAT5 chaining solutions								
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 Systems management	Dual integrated gigabit ethernet controllers on each blade connects to optional <i>GB Ethernet Switch Module</i> Provides remote console and mgmt / power on/off/reset blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager								
System LED panel	System LED panel provides power-on, location, 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 WARRANTY<sup>3</sup>**

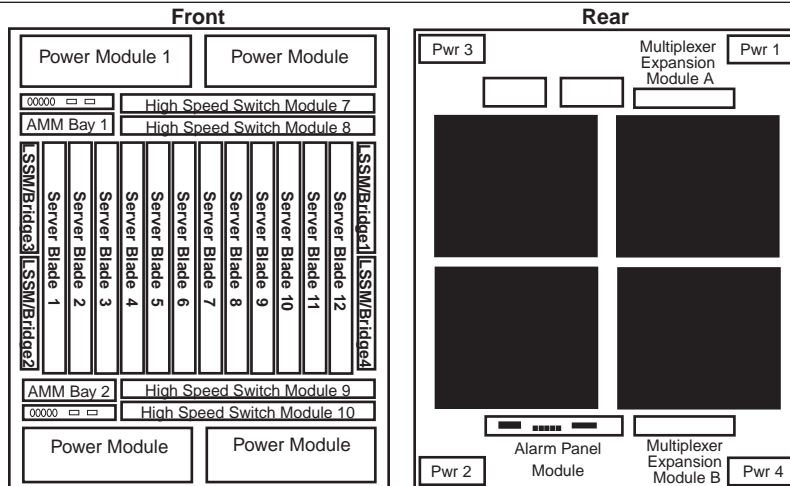
- ⇨ 3 year parts and labor
- ⇨ International Warranty Service<sup>3</sup>
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇨ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9209)
- Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

BladeCenter HT DC Power Supply Module	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 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 <a href="http://ibm.com/products/us">ibm.com/products/us</a>	
Solutions available from IBM BladeCenter Alliance program partners	

\*\*Limitations: 8853 HS21 w/ 4C procs up to 120W, 7995 HS21 XM w/ 4C procs up to 80W, 7998 JS22 limited to ten blades per BCHT chassis, 0792 QS21 limited to non-NEBS environment, 0793 QS22 limited to non-NEBS environment

See footnotes for important warranty information

IBM® Type-model	Supported Blades	Blade Servers std / max	Switch modules std / max	Advanced Management modules std / max	Power modules std / max	Power module Wattage	Fan modules std / max	Mechanical	Available date
8750-1RX	HX5/HS12/HS20/HS21**/HS21XM**/HS22/HS22V/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/PN41/QS21/QS22	0 / 12	0 / 8	1 / 2	2 / 4	3160W (AC 240V)	4 / 4	12U <sup>4</sup> rack	Jun 2007
8750-2RX	HX5/HS12/HS20/HS21**/HS21XM**/HS22/HS22V/JS12/JS20/JS21/JS22/JS23/JS43/LS20/LS21/LS22/LS40/LS41/LS42/PN41/QS21/QS22	0 / 12	0 / 8	2 / 2	4 / 4	3160W (AC 240V)	4 / 4	12U <sup>4</sup> rack	Oct 2010
Positioning Description	<b>Leadership High Speed, High Performance, carrier grade blade platform for Network applications</b> 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	<b>Supports all blades</b> and Blade Expansion Units / 12 hot-swappable bays / front access								
Switch modules	Std/max: none/eight / hot-swap / rear access / Gb Ethernet / Fibre Channel / InfiniBand / Optical Pass-thru / Copper Pass-thru								
Advanced Management Modules	Std/max: 1Rx: one/two; 2Rx: two/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 / 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								
Blower modules	Std/max: four / hot-swap / redundant / speed controlled according to ambient air temperature / rear access / front to back airflow								
Mechanical	<b>EIA 19" rack models (12U<sup>4</sup>)</b> x 706mm deep / supported in NetBAY™ Racks with seismic bracing								
Media Tray	Std/max: 1Rx: one/two; 2Rx: two/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 / supports NetBAY ACT CAT5 chaining solutions								
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 Systems management	Dual integrated gigabit ethernet controllers on each blade connects to optional <b>GB Ethernet Switch Module</b> Provides remote console and mgmt / power on/off/reset blades/modules / monitors power status, operating system, temperature, disks, blowers, power modules / system diagnostic programs provided through IBM Director software / Remote Deployment Manager								
System LED panel	System LED panel provides power-on, location, 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 WARRANTY<sup>3</sup>**

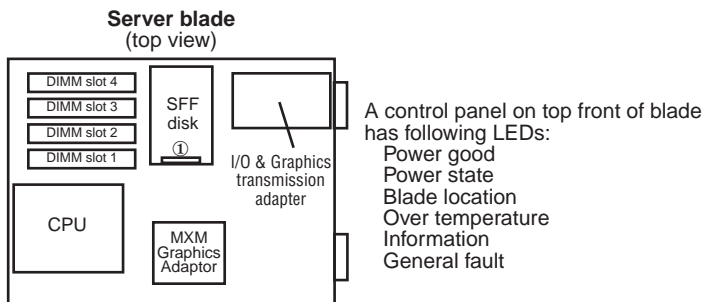
- ⇨ 3 year parts and labor
- ⇨ International Warranty Service<sup>3</sup>
- ⇨ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇨ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 24x7, 2 hr avg response (ServicePac® part num 21P2065)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 30L9185)
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 41L2736)
  - 5 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9207)
  - 5 year IOR 24x7, 2 hr avg response (ServicePac part num 69P9209)
- Other ServicePac options at <http://www-1.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- ⇨ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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 <a href="http://ibm.com/products/us">ibm.com/products/us</a>	
Solutions available from IBM BladeCenter Alliance program partners	

\*\*Limitations: 8853 HS21 w/ 4C procs up to 120W, 7995 HS21 XM w/ 4C procs up to 80W, 7998 JS22 limited to ten blades per BCHT chassis, 0792 QS21 limited to non-NEBS environment, 0793 QS22 limited to non-NEBS environment

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)	<b>Flagship Server-Based Computing for workstation customers providing security, lower TCO, manageability, flexibility and availability</b> 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 <sup>13</sup> 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	<b>Professional 2D:</b> Nvidia® Quadro NVS 120M / 128MB / PCI-Express 16x / UXGA <b>Advanced 3D:</b> Nvidia Quadro FX 1600M / 256MB / PCI-Express 16x / UXGA
SATA disk controller	SATA controller / integrated in ICH8 / 300MB/sec / support for one 2.5" SATA disks
SATA disk bay	One 2.5-inch Small Form Factor (SFF) SATA internal fixed disk bays
External Storage	Support for IBM TotalStorage solutions
Mechanical Architecture/Chipset	Single slot blade / Supported in IBM BladeCenter 8677, 8720, 8730 and 8852 Intel Q965 Express chipset / Graphics Memory Controller Hub provides: integrated graphics and PCI-Express 16x link to MXM3 video adapter / Integrated Controller Hub 8 (ICH8) provides: SATA, USB 2.0, PCI-Express 1x link to I/O and Graphics transmission adapter, PCI-Express x1 link to Broadcom® 5708S, LPC bus to PC87427 for Super I/O
Ethernet	Gigabit Ethernet controller / Broadcom 5708S / full gigabit ethernet MAC and PHY layer functions / chip on blade / PCI-Express / full-duplex / TCP/IP Offload Engine (TOE) / Wake on LAN / Serial over LAN / PXE 2.0 Boot agent / Alert Standard Format 2.0 / controller connects to integrated Broadcom 5389 switch chip / BCM 5389 provides Ethernet and Video Compression interface to I/O Switch Modules
DVD / diskette	Optional via USB at Remote Desktop Appliance / requests for DVD-ROM, diskette and USB port in BladeCenter by pressing media select button on front control panel
Keyboard / mouse	Provided by Remote Desktop Appliance / USB only
Systems Mgmt	IBM Baseboard Management Controller (BMC) / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot
Software ship group	Documentation CD, Broadcom CD, ServerGuide CD
Cooling Fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel
Power supply(s)	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852)
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852)



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

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
- ❖ Preinstalled<sup>17</sup> OS: Windows® Vista Business Blade PC Edition
- ❖ Supported<sup>17</sup> OS: Windows XP Professional 64-bit Edition

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

- ❖ 1 year parts and labor
- ❖ International Warranty Service<sup>3</sup>
- ❖ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ❖ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, NBD response (ServicePac<sup>®</sup> 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>
- ❖ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

IBM® Type-model	Processor	GHz¹ / Core / L2	FSB MHz	Watts	Memory controller	Disk bays	Disk 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
8014-2Ax	1 x Celeron 445	1.86/SC/512KB	1066	65W	1GB	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	Sep 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	June 2010
8028-56x	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	June 2010

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 **Up to 4GB std / 24GB<sup>13</sup> 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 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 / 32MB 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 diagnostics via ROM based preboot DSA**

Security No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

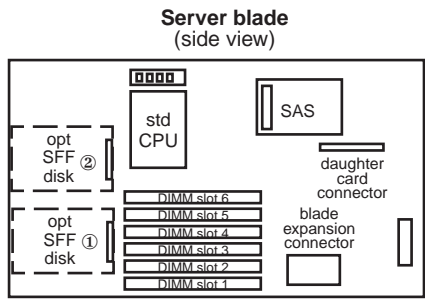
Software ship group Documentation CD, ServerGuide CD

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](http://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: 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 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 HS12 blade server<sup>13</sup>:  
 292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

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

- ⇒ 8014 MT - 1 year parts and labor
- ⇒ 8028 MT - 3 year parts and labor
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- ⇒ 8028 MT On site service upgrade options (in eligible locations):<sup>7</sup>
  - 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>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

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 <sup>13</sup> 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											Xeon 5110 1.6GHz/1066/4MB L2 Cache EM64T Proc Upg 40K1225 Xeon 5120 1.86GHz/1066/4MB L2 Cache EM64T Proc Upg 40K1226 Xeon 5130 2.0GHz/1333/4MB L2 Cache EM64T Proc Upg 40K1227 Xeon 5140 2.33GHz/1333/4MB L2 Cache EM64T Proc Upg 40K1228 Xeon 5150 2.66GHz/1333/4MB L2 Cache EM64T Proc Upg 40K1230 Xeon 5160 3.0GHz/1333/4MB L2 Cache EM64T Proc Upg 40K1229 Xeon E5310 1.6GHz/1066/8MB L2 Cache EM64T Proc Upg 40K1270 Xeon E5320 1.86GHz/1066/8MB L2 Cache EM64T Proc Upg 43W1143 Xeon 5138 2.13GHz/1333/4MB L2 Cache EM64T Proc Upg 40K1218 Xeon 5148 2.33GHz/1333/4MB L2 Cache EM64T Proc Upg 40K1217 Xeon E5335 2.0GHz/1333/8MB L2 Cache EM64T Proc Upg 40K1274 Xeon E5345 2.33GHz/1333/8MB L2 Cache EM64T Proc Upg 43W1144		
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)											2GB (2x1GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit 39M5782 4GB (2x2GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit 39M5791 8GB (2x4GB) PC2-5300 CL5 ECC DDR2 Chipkill FBD 667MHz Kit 39M5797		
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode											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		
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
- blade expansion connector
- daughter card connector
- opt SFF disk
- opt SFF disk

- Stealth black front bezel
- H 9.7" x W 1.14" x D 17.6"; H 24.5cm x W 2.9cm x D 44.6cm
- 12 lbs; 5.4kg (max configuration)
- Configuration/Setup Utility: F1 at startup
- Diagnostics (PC-Doctor™): F2 at startup
- System Partition Boot: ALT+F1 at startup
- Network Boot: F12 at startup
- PXE Boot Agent Utility: Ctrl+S at startup
- Blade control panel on each 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 server<sup>13</sup>:  
292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

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

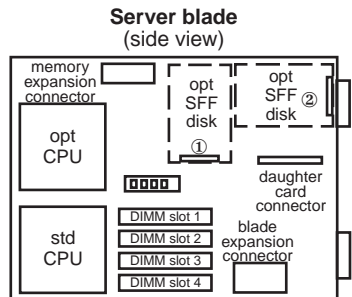
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 4 year IOR 9x5, NBD response (ServicePac® part num 69P9520)
  - 4 year IOR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

See footnotes for important warranty information

IBM® Type-model	Processor	GHz¹	L2 Core	FSB cache	MHz	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
8853-J1x	1 x Xeon™ L5310	1.6	QC	8MB	1066	50W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Apr 2007
8853-J2x	1 x Xeon L5320	1.86	QC	8MB	1066	50W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Apr 2007
8853-C3x	1 x Xeon X5355	2.66	QC	8MB	1333	120W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Apr 2007
8853-C4x	1 x Xeon X5365	3.0	QC	8MB	1333	120W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Sep 2007
8853-G5x	1 x Xeon E5440	2.83	QC	12MB	1333	80W	2GB	SAS	2-fixed	MIO/SIO/PCIEU	up to 2	single slot blade	2 x GB	Dec 2007

Processor(s)	<b>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</b>													
SMP - L2 Cache Implementation	<b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) / <b>6, 8 or 12MB</b> 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	<b>2 or 4GB</b> std / <b>16GB</b> <sup>13</sup> max / two slots used / two slots available / on base blade / <b>PC2-5300</b> 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	<b>LSI Logic® 1064E</b> SAS controller / <b>two port</b> / 300MB/sec / on planar / 64-bit PCI-Express / supports <b>RAID-0 &amp; 1 mirroring</b> / two 29-pin SFF SAS cables													
SAS Disk bays	<b>Two 2.5-inch Small Form Factor (SFF)</b> 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 (C3x & C4x supported in 8852, G7x supported in 8852, 8740, 8750 & 8886) <b>Intel 5000P chipset</b> / 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	<b>Dual gigabit ethernet controller</b> / 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 <i>Optical Passthrough Module</i> (the second controller requires a second optional switch or OPM)													
Network Interface	<b>One legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)													
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	<b>IBM Baseboard Management Controller (BMC)</b> / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module													
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)													
Security	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/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



- 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 server<sup>13</sup>:  
 292GB with two 146GB SAS disks (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 730GB)

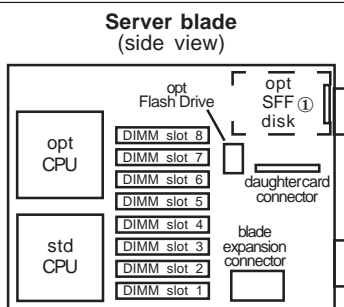
**LIMITED WARRANTY<sup>3</sup>**

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



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

Processor(s)	1 x Intel® Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 3.0GHz with 1333MHz FSB / 4MB L2 ECC Cache / Dual-Core / 1 x Intel Xeon up to 1.86GHz with 1066MHz FSB / 1 x Intel Xeon up to 2.33GHz with 1333MHz FSB / 8MB L2 ECC Cache / Quad-Core / All EM64T / NTx and H1x feature Low Voltage processors for reduced heat and power consumption												
SMP - L2 Cache Implementation	2-way SMP / up to two Xeon Processors (same speed/cache size) / 4 or 8MB L2 std and max / at processor speed Systemboard contains two Intel LGA771 sockets, eight DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet												
Memory	1 or 2GB std / 32GB <sup>13</sup> 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										Xeon 5110 1.6GHz/1066/4MBL2CacheEM64TProcUpg	42C0562	
Diagnostics	Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)										Xeon 5120 1.86GHz/1066/4MBL2CacheEM64TProcUpg	40C0563	
											Xeon 5130 2.0GHz/1333/4MBL2CacheEM64TProcUpg	40C0564	
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode										Xeon 5140 2.33GHz/1333/4MBL2CacheEM64TProcUpg	40C0565	
											Xeon 5150 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										Xeon 5160 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	
											Xeon 5138 2.13GHz/1333/4MBL2CacheEM64TProcUpg	40C0568	
Power supply(s)	Prerequisites Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system										Xeon 5148 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 <a href="http://ibm.com/products/us/">ibm.com/products/us/</a>		



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<sup>13</sup>:  
146GB with one SAS disk (with BladeCenter Storage Expansion Unit  
3 x 146GB for total of 438GB)

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

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

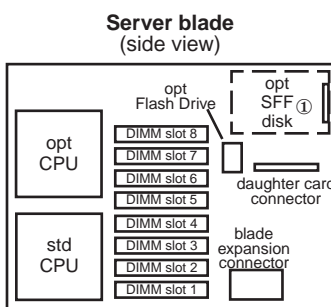
See footnotes for important warranty information

IBM® Type-model	Processor	GHz <sup>1</sup>	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-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-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

Processor(s)	<b>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</b>													
SMP - L2 Cache Implementation	<b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size) / <b>6, 8 or 12MB</b> 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	<b>1, 2 or 4GB</b> std / <b>32GB<sup>13</sup></b> max / two slots used / six slots available / on base blade / <b>PC2-5300</b> 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	<b>LSI Logic® 1064E</b> SAS controller / <b>two port</b> / 300MB/sec / on planar / 64-bit PCI-Express / supports <b>RAID-0 &amp; 1 mirroring</b> / one 29-pin SFF SAS cable													
SAS Disk bays	<b>One 2.5-inch Small Form Factor (SFF)</b> 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) <b>Intel 5000P chipset</b> / 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	<b>Dual gigabit ethernet controller</b> / 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 <i>Optical Passthrough Module</i> (the second controller requires a second optional switch or OPM)													
Network Interface	<b>One legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)													
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	<b>IBM Baseboard Management Controller (BMC)</b> / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module													
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)													
Security	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](http://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<sup>®</sup> 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<sup>a3</sup>: 146GB with one SAS disk (with BladeCenter Storage Expansion Unit 3 x 146GB for total of 438GB)

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

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

See footnotes for important warranty information

\* Express Models

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 /**  
 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 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

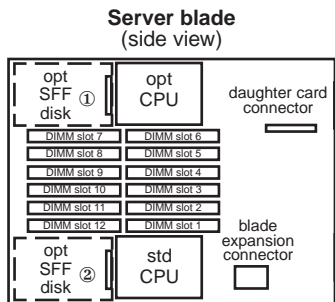
Cooling Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel

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](http://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 Analysis<sup>3</sup> alerts on memory, processor(s), and disk(s) with IBM Director

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

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

Maximum internal disk capacity for each HS22 blade server<sup>3</sup>: 600GB with two 300GB SAS disks

IBM® Type-model	Processor	GHz <sup>1</sup>	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
7870-6Mx*	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

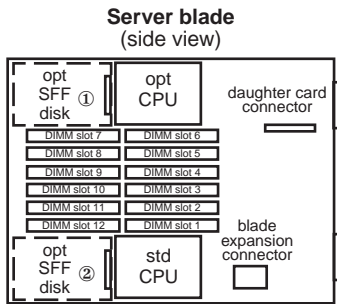
Cooling Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel

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

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

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 5.86Ts Proc Upg	44T1736
Xeon E5530 2.4GHz 80W 5.86Ts Proc Upg	44T1883
Xeon E5540 2.53GHz 80W 5.86Ts 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
8GB (1x8GB) PC3-8500 CL7 ECC DDR3 1066MHz VLP RDIMM	44T1579
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](http://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: 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,

Maximum internal disk capacity for each HS22 blade server<sup>13</sup>: 600GB with two 300GB SAS disks

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

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

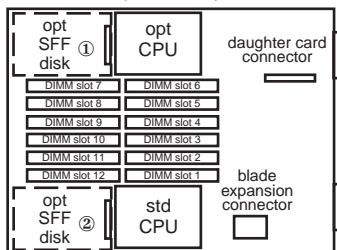
IBM® Type-model	Processor	GHz <sup>1</sup>	L3 Core cache	Watts	Memory	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date
7870-L3x	1 x Xeon® L5530	2.4	4C 8MB	60W	2x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Sep 2009
7870-M2x	1 x Xeon L5518	2.13	4C 8MB	60W	2x2GB	SAS	2 hot-swap	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	<b>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</b> 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 / <b>48GB</b> max per processor(using 8GB DIMMs) / <b>PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs</b> / twelve slots on base blade / ChipKill / memory mirroring										
Disk Controller	<b>LSI Logic® 1064E</b> SAS controller / <b>four port</b> / 300MB/sec / on planar / 64-bit PCI-Express / supports <b>RAID-0 &amp; 1 / Two 2.5-inch Small Form Factor (SFF)</b> 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	<b>Intel 5520 chipset</b> / 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	<b>Dual Gigabit Ethernet ports</b> / 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	<b>One legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)										
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	<b>Integrated Management Module(IMM)</b> / 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	<b>Light Path Diagnostics™</b> (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](http://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 server<sup>13</sup>:  
 600GB with two 300GB SAS disks

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

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

IBM® Type-model	Processor	GHz <sup>1</sup>	Core	L3 cache	Watts	Memory	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date
7870-D3x	1 x Xeon® E5503	2.0	2C	4MB	80W	3x1GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-A4x	1 x Xeon E5507	2.26	4C	4MB	80W	3x1GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-G2x	1 x Xeon E5620	2.4	4C	12MB	80W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-G4x	1 x Xeon E5640	2.66	4C	12MB	80W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-H2x	1 x Xeon X5650	2.66	6C	12MB	95W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-H4x	1 x Xeon X5670	2.93	6C	12MB	95W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-H5x	1 x Xeon X5667	3.06	4C	12MB	95W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-N2x	1 x Xeon L5640	2.26	6C	12MB	60W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-GCx	1 x Xeon E5640	2.66	4C	12MB	80W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-HAx	1 x Xeon X5650	2.66	6C	12MB	95W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-EEx*	1 x Xeon E5503	2.0	4C	4MB	80W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-EGx*	2 x Xeon E5630	2.53	4C	12MB	80W	6x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Mar 2010
7870-F2x	1 x Xeon X5680	3.33	6C	12MB	130W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Aug 2010
7870-F3x	1 x Xeon X5677	3.46	4C	12MB	130W	3x2GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Aug 2010

Positioning Processor(s) *Two-socket, high performance blade server for business and distributed enterprises*  
**Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 3.46GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading**  
 L3 cache **4 or 12MB** 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 / 96GB max per processor(using 16GB 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, H and HT

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 None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel  
 Kybd / video / mouse None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel  
 Graphics controller 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

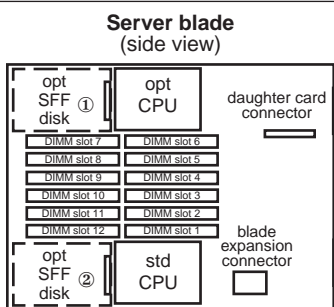
Software ship group Documentation CD, Broadcom CD, ServerGuide CD

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

- Xeon E5503 2C 2.0GHz 4MB L3 80W
- Xeon E5507 4C 2.26GHz 4MB L3 80W
- Xeon L5640 6C 2.26GHz 12MB 80W
- Xeon E5620 4C 2.4GHz 12MB 80W
- Xeon E5630 4C 2.53GHz 12MB 80W
- Xeon E5640 4C 2.66GHz 12MB 80W
- Xeon X5650 6C 2.66GHz 12MB 95W
- Xeon X5670 6C 2.93GHz 12MB 95W
- Xeon X5667 4C 3.06GHz 12MB 95W
- Xeon X5677 4C 3.46GHz 12MB 130W
- Xeon X5680 6C 3.33GHz 12MB 130W
- 1GB (1x1GB) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM
- 2GB (1x2GB) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM
- 4GB (1x4GB) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM
- 8GB (1x8GB) PC3-8500 CL7 ECC DDR3 1066MHz VLP RDIMM
- IBM 300GB 10K 6Gb SAS 2.5" SFF Slim-HS HDD
- IBM 31.4GB SSD 2.5" SFF Slim-HS HDD
- SAS Connectivity Card for IBM BladeCenter
- Ethernet Expansion Card for IBM BladeCenter
- Other options at [ibm.com/products/us](http://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: 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

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

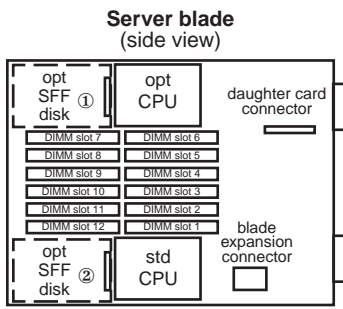
Maximum internal disk capacity for each HS22 blade server<sup>13</sup>:  
 600GB with two 300GB SAS disks

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

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

IBM® Type-model	Processor/core	L3 cache	Watts	Memory	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date	
7870-A5x	1 x Xeon® E5603	1.6GHz/4C	4MB	80W	1x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-A7x	1 x Xeon E5607	2.26GHz/4C	8MB	80W	1x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-B5x	1 x Xeon X5647	2.93GHz/4C	12MB	130W	3x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-B6x	1 x Xeon E5649	2.53GHz/6C	12MB	80W	3x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-C5x	1 x Xeon X5672	3.2GHz/4C	12MB	95W	3x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-C6x	1 x Xeon X5675	3.06GHz/6C	12MB	95W	3x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-C7x	1 x Xeon X5687	3.60GHz/4C	12MB	130W	3x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011
7870-C8x	1 x Xeon X5690	3.46GHz/6C	12MB	130W	3x4GB	SAS	2 hot-swap	up to 2	single slot blade	2 x Gb	Feb 2011

Positioning Processor(s)	<i>Two-socket, high performance blade server for business and distributed enterprises</i>	
L3 cache	<b>Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 3.6GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>	
SMP	<b>Up to 12MB</b> std and max / at processor speed <b>2-way SMP</b> / 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	4 or 12GB std / <b>96GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs</b> / twelve slots on base blade / ChipKill / memory mirroring	
Disk Controller	<b>LSI Logic® 1064E SAS controller / four port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 &amp; 1 / Two 2.5-inch Small Form Factor (SFF) hot swap disk bays / supports SAS, SATA or SSD SFF disks</b>	
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, H and HT	
Architecture/Chipset	<b>Intel 5520 chipset</b> / 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	<b>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)</b>	
Network Interface	<b>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)</b>	
Optical / diskette / USB	None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel	
Kybd / video / mouse	None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel	
Graphics controller	SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / 32-bit 33MHz PCI 2.2	
Systems Mgmt	<b>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</b>	
Diagnostics	<b>Light Path Diagnostics™</b> (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	Xeon E5603 4C 1.60GHz 4MB L3 80W 81Y9323 Xeon E5607 4C 2.26GHz 8MB L3 80W 81Y9325 Xeon X5647 4C 2.93GHz 8MB 130W 81Y9326 Xeon E5649 6C 2.53GHz 12MB 80W 81Y9327 Xeon X5672 4C 3.20GHz 12MB 95W 81Y9328 Xeon X5675 6C 3.06GHz 12MB 95W 81Y9329 Xeon X5687 4C 3.60GHz 12MB 130W 81Y9330 Xeon X5690 6C 3.46GHz 12MB 130W 81Y9331
Cooling	Uses cooling from BladeCenter / thermal sensors on each processor, BladeCenter modules and front panel	2GB (1x2GB 1Rx4) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM 46C0561 4GB (1x4GB 2Rx4 ) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM 46C0567 8GB (1x8GB 2Rx4 ) PC3L-8500 CL7 ECC DDR3 1066MHz VLP RDIMM 46C0569 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
Power supply(s)	Uses power module(s) in BladeCenter chassis	
Prerequisites	Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter chassis, operating system	Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>



- ⊖ Stealth black front bezel
- ⊖ H 9.7" x W 1.14" x D 17.6"
- ⊖ H 24.5cm x W 2.9cm x D 44.6cm
- ⊖ 12 lbs; 5.4kg (max configuration)
- ⊖ Configuration/Setup Utility: F1 at startup
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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:  
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Maximum internal disk capacity for each HS22 blade server<sup>13</sup>:  
 600GB with two 300GB SAS disks

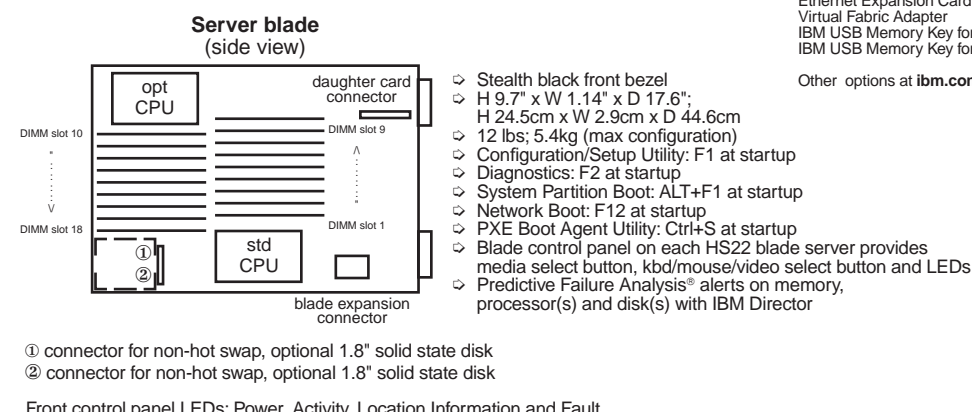
**LIMITED WARRANTY<sup>3</sup>**

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

IBM® Type-model	Processor	GHz <sup>1</sup>	Core	L3 cache	Watts	Memory	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date
7871-B4x	1 x Xeon® E5540	2.53	4C	8MB	80W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-C4x	1 x Xeon X5570	2.93	4C	8MB	95W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-A4x	1 x Xeon E5507	2.26	4C	4MB	80W	3x1GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-D3x	1 x Xeon E5503	2.0	2C	4MB	80W	3x1GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-G2x	1 x Xeon E5620	2.40	4C	12MB	80W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-G4x	1 x Xeon E5640	2.66	4C	12MB	80W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-H2x	1 x Xeon X5650	2.66	6C	12MB	95W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-H4x	1 x Xeon X5670	2.93	6C	12MB	95W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-H5x	1 x Xeon X5667	3.06	4C	12MB	95W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-N2x	1 x Xeon L5640	2.26	6C	12MB	60W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-HAx	1 x Xeon X5650	2.66	6C	12MB	95W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-GDx	1 x Xeon E5640	2.66	4C	12MB	80W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-EHx	1 x Xeon X5660	2.80	4C	12MB	95W	6x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-EGx	1 x Xeon E5640	2.66	4C	12MB	80W	6x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Mar 2010
7871-F2x	1 x Xeon X5680	3.33	6C	12MB	130W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Aug 2010
7871-F3x	1 x Xeon X5677	3.46	4C	12MB	130W	3x2GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Aug 2010

Positioning Processor(s)	Two-socket, high performance blade server optimized for virtualization <b>Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 3.46GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>
L3 cache SMP	4 or 12MB std and max / at processor speed <b>2-way SMP / up to two Xeon Processors (same speed/cache size)</b>
Implementation	Systemboard contains two Socket B (LGA1366) sockets, eighteen DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports
Memory	6GB std / <b>144GB</b> max per processor(using 16GB DIMMs) / <b>PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs</b> / eighteen slots on base blade / ChipKill / memory mirroring
Disk Controller Disks	<b>LSI Logic® 1064E SAS controller / four port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 &amp; 1 / Two Solid State Disk (SSD) connectors / supports 1.8" non-hot swap SSD disks</b>
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, H and HT
Architecture/Chipset	<b>Intel 5520 chipset</b> / 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	<b>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)</b>
Network Interface	<b>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)</b>
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	<b>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</b>
Diagnostics	<b>Light Path Diagnostics™</b> (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 E5540 2.53GHz 80W 5.86Ts Proc Upg 49Y5163
- Xeon X5570 2.93GHz 95W 6.4GTs Proc Upg 49Y5172
- Xeon E5506 2.13GHz 80W 6.4GTs Proc Upg 49Y5151
- Xeon X5677 3.46GHz 130W 6.4GTs Proc Upg 69Y4747
- Xeon X5680 3.33GHz 130W 6.4GTs Proc Upg 69Y4748
- 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
- 8GB (1x8GB) PC3-8500 CL7 ECC DDR3 1066MHz VLP RDIMM 44T1579
- IBM 50GB SSD 1.8" 43W7734
- SAS Connectivity Card for IBM BladeCenter 43W4068
- Ethernet Expansion Card for IBM BladeCenter 44W4475
- Virtual Fabric Adapter 49Y4235
- IBM USB Memory Key for VMware Hypervisor ESXi 3.5 U4 41Y8269
- IBM USB Memory Key for VMware Hypervisor ESXi 4.0 41Y8278



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

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

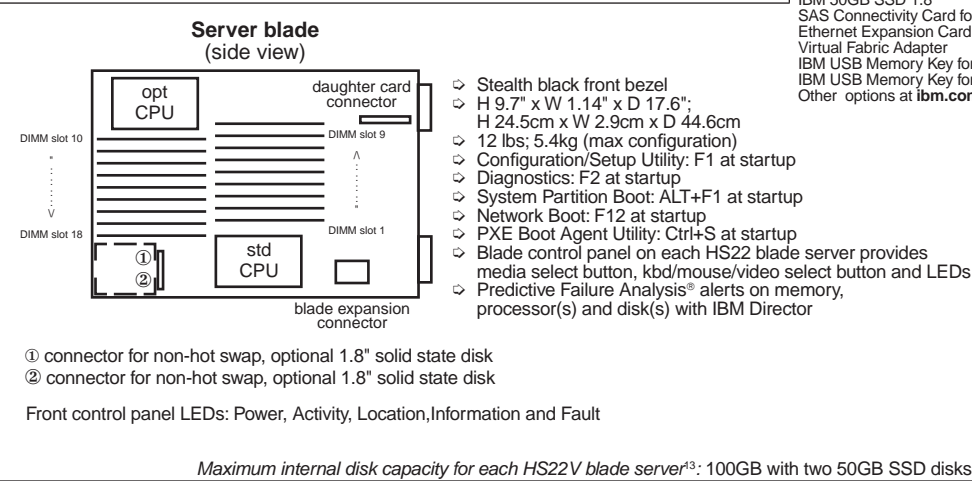
Maximum internal disk capacity for each HS22V blade server<sup>13</sup>: 100GB with two 50GB SSD disks



IBM® Type-model	Processor/Core	L3 cache	Watts	Memory	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date
7871-A5x 1 x Xeon®	E5603 1.6GHz/4C	4MB	80W	1x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-A7x 1 x Xeon	E5607 2.26GHz/4C	8MB	80W	1x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-B5x 1 x Xeon	X5647 2.93GHz/4C	12MB	130W	3x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-B6x 1 x Xeon	E5649 2.53GHz/6C	12MB	80W	3x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-C5x 1 x Xeon	X5672 3.2GHz/4C	12MB	95W	3x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-C6x 1 x Xeon	X5675 3.06GHz/6C	12MB	95W	3x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-C7x 1 x Xeon	X5687 3.60GHz/4C	12MB	130W	3x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011
7871-C8x 1 x Xeon	X5690 3.46GHz/6C	12MB	130W	3x4GB	SAS	2 fixed	up to 2	single slot blade	2 x Gb	Feb 2011

Positioning Processor(s)	<i>Two-socket, high performance blade server optimized for virtualization</i> <b>Up to two Next Generation Intel® Xeon featuring Quick Path Interconnect(QPI) at up to 3.60GHz with up to 12MB L3 / up to 6 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>
L3 cache SMP	<b>4, 8 or 12MB</b> std and max / at processor speed <b>2-way SMP</b> / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Socket B (LGA1366) sockets, eighteen DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports
Memory	<b>4 or 12GB std / 144GB max per processor(using 16GB DIMMs) / PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs</b> / eighteen slots on base blade / ChipKill / memory mirroring
Disk Controller Disks	<b>LSI Logic® 1064E SAS controller / four port / 300MB/sec / on planar / 64-bit PCI-Express / supports RAID-0 &amp; 1 / Two Solid State Disk (SSD) connectors</b> / supports 1.8" non-hot swap SSD 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, H and HT
Architecture/Chipset	<b>Intel 5520 chipset</b> / 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	<b>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)</b>
Network Interface	<b>One legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
Optical / diskette / USB Kybd / video / mouse	None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel
Graphics controller	None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel
Systems Mgmt	<b>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 cVMM standard</b>
Diagnostics	<b>Light Path Diagnostics™</b> (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 E5603 4C 1.60GHz 4MB L3 80W	81Y6038
Xeon E5607 4C 2.26GHz 8MB L3 80W	81Y6040
Xeon X5647 4C 2.93GHz 8MB 130W	81Y6041
Xeon E5649 6C 2.53GHz 12MB 80W	81Y6042
Xeon X5672 4C 3.20GHz 12MB 95W	81Y6043
Xeon X5675 6C 3.06GHz 12MB 95W	81Y6044
Xeon X5687 4C 3.60GHz 12MB 130W	81Y6045
Xeon X5690 6C 3.46GHz 12MB 130W	81Y6046
2GB (1x2GB 1Rx4) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	46C0561
4GB (1x4GB 2Rx4 ) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	46C0567
8GB (1x8GB 2Rx4 ) PC3L-8500 CL7 ECC DDR3 1066MHz VLP RDIMM	46C0569
IBM 50GB SSD 1.8"	43W7734
SAS Connectivity Card for IBM BladeCenter	43W4068
Ethernet Expansion Card for IBM BladeCenter	44W4475
Virtual Fabric Adapter	49Y4235
IBM USB Memory Key for VMware Hypervisor ESXi 3.5 U4	41Y8269
IBM USB Memory Key for VMware Hypervisor ESXi 4.0	41Y8278
Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>	



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

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

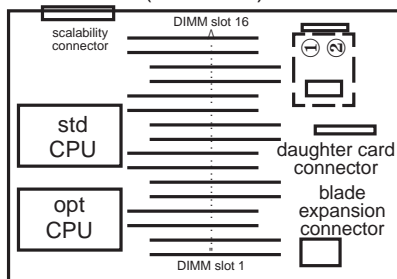
IBM® Type-model	Processor	GHz <sup>1</sup>	Core	L3 cache	Watts	Memory	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date
7872-42x	1 x Xeon® E7520	1.86	4C	18MB	95W	2x4GB	SAS	up to 2	up to 2	single blade	2 x 1Gb	Jun 2010
7872-61x	1 x Xeon E7530	1.86	6C	12MB	105W	2x4GB	SAS	up to 2	up to 2	single blade	2 x 1Gb	Jun 2010
7872-64x	1 x Xeon E7540	2.0	6C	18MB	105W	2x4GB	SAS	up to 2	up to 2	single blade	2 x 1Gb	Jun 2010
7872-65x	1 x Xeon E7540	2.0	6C	18MB	105W	2x4GB	SAS	up to 2	up to 2	single blade	2 x 10Gb	Jun 2010
7872-82x	1 x Xeon L7555	1.86	8C	24MB	95W	2x4GB	SAS	up to 2	up to 2	single blade	2 x 1Gb	Jun 2010
7872-E6x*	1 x Xeon E7540	2.0	6C	18MB	105W	16x4GB	SAS	up to 2	up to 2	single blade	2 x 10Gb	Jun 2010

Positioning Processor(s)	<i>Maximum performance and flexibility, optimized for database and virtualization in a scalable two-socket blade</i> <b>Up to two Next Generation Intel® Xeon EX featuring Quick Path Interconnect(QPI) at up to 2GHz with up to 24MB L3 / up to 8 Core / with Intel Turbo Boost Technology and Hyper-Threading(excludes 42x and 82x)</b>											
L3 cache SMP	<b>12, 18 or 24MB</b> std and max / shared 2-way SMP / up to two Xeon Processors (same speed/cache size)											
Implementation	Systemboard contains two Socket-LS(LGA1567-pin) sockets, sixteen DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports											
Scalability	Scalable to four-socket, 32 DIMM, double-wide form factor, two-node via QPI links											
Memory	8 or 64GB std / <b>64GB</b> max per processor(using 8GB DIMMs) / PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs / sixteen slots on base blade / ChipKill / memory mirroring											
MAX5	24 DIMM slots / single-wide / tool-free / memory expansion drawer / optional / system max of 40 DIMM slots											
Disk Controller	<b>LSI Logic® 1064E SAS controller / four port / 300MB/sec / on SSD expansion card / 64-bit PCI-Express / RAID 0/1 / Two Solid State Disk (SSD) connectors / supports 1.8" non-hot swap SSD disks</b>											
Disks	Dedicated USB-based slot on systemboard for optional Hypervisor USB key											
Flash Storage	Support for IBM TotalStorage™ solutions											
External Storage	Single-wide blade / Supported in IBM BladeCenter S, H and HT(AC power only)											
Mechanical												
Architecture/Chipset	<b>Intel 7500 chipset</b> / Intel IO Hub provides PCI-Express bridge to: ICH10 South Bridge, High Speed Daughter Card connector and Legacy Daughter Card connector(CIOv), LSI 1064E SAS / ICH10 South Bridge provides: BCM5709S, USB, PCI-Express and LPC bus to IMM for video and limited Super I/O											
BUS slots	No PCI or PCI-X slots (expansion via modules or network-interface option connector)											
Ethernet	<b>Dual Gigabit Ethernet ports</b> / 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) / Emulex® 10Gb dual-port Virtual Fabric adapter standard on 65x & E6x, others upgradeable via option											
Network Interface	<b>One high-speed and one legacy connector for I/O expansion options / PCI-Express</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)											
Optical / diskette / USB	None / requests for optical, diskette and USB port in BladeCenter by pressing media select button on front control panel											
Kybd / video / mouse	None / requests for keyboard, video and mouse in BladeCenter by pressing the display button on front control panel											
Graphics controller	SVGA / Matrox® G200e integrated in IMM on systemboard / 16MB DDR2-250MHz SDRAM std/max / PCI Express											
Systems Mgmt	<b>Integrated Management Module(IMM)</b> / VSC452 / H8S2472 / 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	<b>Light Path Diagnostics™</b> (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 E7520	1.86GHz/4C/95W/18MB L3/4.86GT/s Proc Upg	46M6863
Xeon E7530	1.86GHz/6C/105W/12MB L3/5.86GT/s Proc Upg	59Y5899
Xeon E7540	2.0GHz/6C/105W/18MB L3/6.4GT/s Proc Upg	59Y5859
Xeon L7555	1.86GHz/8C/95W/24MB L3/5.86T/s Proc Upg	46M6873
4GB (1x4GB)2Rx8 PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM		44T1596
8GB (1x8GB)4Rx8 PC3-8500 CL7 ECC DDR3 1066MHz VLP RDIMM		46C7499
IBM 50GB SSD 1.8"		43W7734
SSD Expansion Card for BladeCenter HX5		46M6908
SAS Connectivity Card for IBM BladeCenter		43W4068
Ethernet Expansion Card for IBM BladeCenter		44W4475
IBM HX5 1-Node Speed Burst Card		59Y5889
IBM HX5 2-Node Scalability Kit		46M6975

Other options at [ibm.com/products/us](http://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 HX5 blade server provides media select button, kbd/mouse/video select button and LEDs
- Predictive Failure Analysis® alerts on memory and processor(s) with IBM Director

- ① connector for non-hot swap, optional 1.8" solid state disk
- ② connector for non-hot swap, optional 1.8" solid state disk

Front control panel LEDs: Power, Activity, Location, Information and Fault

65x & E6x models come preinstalled with Emulex 10Gb Virtual Fabric adapter. This adapter is not currently supported under SUSE® Linux Enterprise Server 11

Maximum internal disk capacity for each HX5<sup>13</sup>: 100GB with two 50GB SSD disks

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

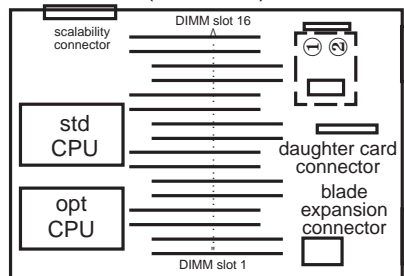
- **3 year parts and labor**
- **International Warranty Service<sup>3</sup>**
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **On site service upgrade options (in eligible locations):<sup>7</sup>**
  - 4 year IOR 9x5, NBD response** (ServicePac® part num 84Y2402)
  - 4 year IOR 9x5, 4 hr avg response** (ServicePac part num 84Y2403)
  - 4 year IOR 24x7, 4 hr avg response** (ServicePac part num 84Y2404)
  - 4 year IOR 24x7, 2 hr avg response** (ServicePac part num 84Y2405)
- **Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>**
- **24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>**

IBM® Type-model	Qty x Processor/Core	L3 cache	Watts	Memory	Dimm slots	Disk controller	Disk bays	I/O slots	Mechanical	Ethernet	Available date
7872-63x	2 x Xeon® E6540 2.0GHz/6C	18MB	105W	4x4GB	16+24	SAS	up to 2	up to 2	single+MAX5	2 x 1Gb	Oct 2010
7872-6Dx	2 x Xeon E6540 2.0GHz/6C	18MB	105W	4x4GB	16+24	SAS	up to 2	up to 2	single+MAX5	2 x 10Gb	Oct 2010
7872-68x	2 x Xeon E6540 2.0GHz/6C	18MB	105W	40x4GB	16+24	SAS	up to 2	up to 2	single+MAX5	2 x 10Gb	Oct 2010
7872-83x	2 x Xeon X7560 2.0GHz/8C	18MB	130W	4x4GB	16+24	SAS	up to 2	up to 2	single+MAX5	2 x 1Gb	Oct 2010
7872-84x	2 x Xeon X7560 2.26GHz/8C	24MB	130W	4x4GB	16+24	SAS	up to 2	up to 2	single+MAX5	2 x 1Gb	Oct 2010
7872-86x	1 x Xeon X7560 2.26GHz/8C	24MB	130W	2x4GB	16	SAS	up to 2	up to 2	single blade	2 x 10Gb	Oct 2010
7872-E8x*	2 x Xeon X6550 2.0GHz/8C	18MB	130W	28x4GB	16+24	SAS	up to 2	up to 2	single+MAX5	2 x 10Gb	Oct 2010
7872-66x	2 x Xeon E7540 2.0GHz/6C	18MB	105W	8x4GB	16	SAS	up to 2	up to 2	single+BPE4	2 x 1Gb	Jan 2011

Positioning Processor(s)	Maximum performance and flexibility, optimized for database and virtualization in a scalable two-socket blade <b>Up to two Next Generation Intel® Xeon EX featuring Quick Path Interconnect (QPI) at up to 2.26GHz with up to 24MB L3 / up to 8 Core / with Intel Turbo Boost Technology and Hyper-Threading</b>
L3 cache SMP	<b>18 or 24MB</b> std and max / shared 2-way SMP / up to two Xeon Processors (same speed/cache size)
Implementation	Systemboard contains two Socket-LS(LGA1567-pin) sockets, sixteen DIMM slots, one High Speed Daughter Card connector, one I/O expansion option connector, integrated graphics and dual Gigabit ethernet ports
Scalability	Scalable to four-socket, 32 DIMM, double-wide form factor, two-node via QPI links
Memory	Up to 160GB std / <b>64GB</b> max per processor(using 8GB DIMMs) / PC3-10600 1333MHz VLP 240-pin ECC DDR3 SDRAM DIMMs / sixteen slots on base blade / ChipKill / memory mirroring
MAX5	24 DIMM slots / single-wide / tool-free / memory expansion drawer / std(except 66x, 86x) / system max of 40 DIMM slots
Disk Controller	<b>LSI Logic® 1064E SAS controller / four port / 300MB/sec / on SSD expansion card / 64-bit PCI-Express / RAID 0/1 / Two Solid State Disk (SSD) connectors / supports 1.8" non-hot swap SSD disks</b>
Disks	Dedicated USB-based slot on systemboard for optional Hypervisor USB key
Flash Storage	Support for IBM TotalStorage™ solutions
External Storage	Single-wide blade + MAX5(except 66x, 86x) / single-wide blade + PCI Express Gen 2 Expansion blade (66x only) / Supported in IBM BladeCenter S, H and HT(AC power only)***
Mechanical	
Architecture/Chipset	<b>Intel 7500 chipset / Intel IO Hub provides PCI-Express bridge to: ICH10 South Bridge, High Speed Daughter Card connector and Legacy Daughter Card connector(CIOV), LSI 1064E SAS / ICH10 South Bridge provides: BCM5709S, USB, PCI-Express and LPC bus to IMM for video and limited Super I/O</b>
BUS slots	Base blade expansion via modules or network-interface option connector only / up to twp PCI-E 2.0 slots on 66x via BPE4
Ethernet	<b>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) / Emulex® 10Gb dual-port Virtual Fabric adapter standard on 6Dx, 68x, 86x &amp; E8x, others upgradeable via option</b>
Network Interface	<b>One high-speed and one legacy connector for I/O expansion options / PCI-Express /</b> Requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)
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 / PCI Express
Systems Mgmt	<b>Integrated Management Module(IMM) / VSC452 / H8S2472 / 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</b>
Diagnostics	<b>Light Path Diagnostics™</b> (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 E6540 2.0GHz/6C/105W/18MB L3/6.4GT/s Proc Upg	46M6955
Xeon X6550 2.0GHz/8C/130W/18MB L3/6.4GT/s Proc Upg	46M6995
Xeon X7560 2.26GHz/8C/130W/24MB L3/6.4GT/s Proc Upg	46M6960
2GB (1x2GB)2Rx8 PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	44T1486
4GB (1x4GB)2Rx8 PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	44T1596
8GB (1x8GB)4Rx8 PC3-8500 CL7 ECC DDR3 1066MHz VLP RDIMM	46C7499
IBM 50GB SSD 1.8"	43W7734
SSD Expansion Card for BladeCenter HX5	46M6908
SAS Connectivity Card for IBM BladeCenter	43W4068
Ethernet Expansion Card for IBM BladeCenter	44W4475
IBM HX5 1-Node Speed Burst Card	59Y5889
IBM HX5 2-Node Scalability Kit	46M6975

**Server blade (side view)**



- Stealth black front bezel
- single-wide-H 9.7" x W 1.14" x D 17.6";
- single-wide-H 24.5cm x W 2.9cm x D 44.6cm
- double-wide-H 9.7" x W 2.28" x D 17.6";
- double-wide-H 24.5cm x W 5.8cm x D 44.6cm
- 12 to 21 lbs; 5.4 to 9.5kg (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 HX5 blade server provides media select button, kbd/mouse/video select button and LEDs
- Predictive Failure Analysis® alerts on memory and processor(s) with IBM Director

- ① connector for non-hot swap, optional 1.8" solid state disk
- ② connector for non-hot swap, optional 1.8" solid state disk

Front control panel LEDs: Power, Activity, Location, Information and Fault

- \*\* 6Dx, 68x, 86x & E8x models come preinstalled with Emulex 10Gb Virtual Fabric adapter  
This adapter is not currently supported under SUSE® Linux Enterprise Server 11
- \*\*\* 86x is only supported in BladeCenter H with enhanced blower modules (68Y6650)
- \*\*\*\* 66x comes preinstalled with IBM 320GB High IOPS MS Class SSD PCI-E adapter (46M0898)

Maximum internal disk capacity for each HX5<sup>13</sup>: 100GB with two 50GB SSD disks

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

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 4 year IOR 9x5, NBD response (ServicePac® part num 84Y2402)
  - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 84Y2403)
  - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 84Y2404)
  - 4 year IOR 24x7, 2 hr avg response (ServicePac part num 84Y2405)
- Other ServicePac options at <http://www.ibm.com/services/us/its/pdf/wamomxeu.pdf>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

IBM® Type-model	Qty x Processor	GHz <sup>1</sup>	Core	L2 Cache	Memory	Disk	Disk controller	Disk bays	Optional storage expansion unit	Mechanical	Ethernet	Available date
8844-31U	2 x PPC 970MP	2.7*	SC	1MB	2x512MB 400MHz	Open	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Mar 2006
8844-51U	2 x PPC 970MP	2.5*	DC	2x1MB	2x1GB 400MHz	Open	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Mar 2006
8844-E3U	2 x PPC 970MP	2.7*	SC	1MB	2x1GB 533MHz	1x73GB	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Aug 2006
8844-E5U	2 x PPC 970MP	2.5*	DC	2x1MB	2x2GB 533MHz	1x73GB	SAS	2 Fixed	3 Hot Swap SAS***	9.5mm blade	2 x Gigabit	Aug 2006
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)** 2 x IBM PowerPC™ 970MP up to 2.7GHz\* Single-Core / up to 2.5GHz\* Dual-Core / 64 bit  
**L2 Cache** 1MB L2 Cache per core  
**SMP support** 2-core or 4-core SMP / two PowerPC Processors (single core or dual core)  
**Implementation** 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<sup>13</sup> max / two slots used / two slots available / PC2-3200 400MHz CL3 ECC DDR2-SDRAM DIMMs or PC2-4200 533MHz CL4 ECC DDR2-SDRAM DIMMs / four DIMM gold-connector slots / DIMMs must be installed in matched pairs (a bank) and banks must match in speed (MHz), though not size / 2-way memory interleave / dual-channel / Chipkill with x4 DIMMs

**SAS Disk controller** One integrated / IBM SAS controller / two port / on planar / 64-bit 133MHz PCI-X / supports RAID-0 & 1  
**SAS Disk bays** 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  
**External Storage** 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

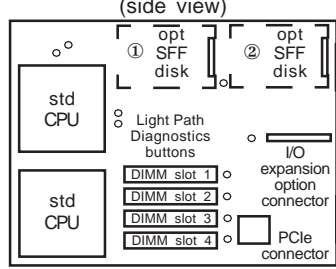
**Systems Mgmt** IBM Integrated Service Processor / H82166 / IPMI 1.5 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module / Cluster System Management / IBM Active Energy Manager™ / HMCMP

**Diagnostics** Light Path Diagnostics (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)  
**Security** No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode

**Software ship group** Documentation CD, IBM Director CD, Device Driver CD  
**Cooling Fans** Uses cooling from BladeCenter (types 8677, 8852 and 8720) / thermal sensors on each processor and BladeCenter modules and front panel  
**Power supply(s)** Uses power module(s) in BladeCenter (types 8677, 8852 and 8720)  
**Prerequisites** Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8852 and 8720), operating system

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 NHS HDD	26K5776
IBM 73GB 10K SAS 2.5" SFF NHS 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 <a href="http://ibm.com/products/us">ibm.com/products/us</a>	

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

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

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

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

<sup>\*</sup>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  
<sup>\*\*</sup>BladeCenter T NEBS compliance available September 2006  
<sup>\*\*\*</sup>BladeCenter Storage Expansion Unit support available 2nd Quarter 2007

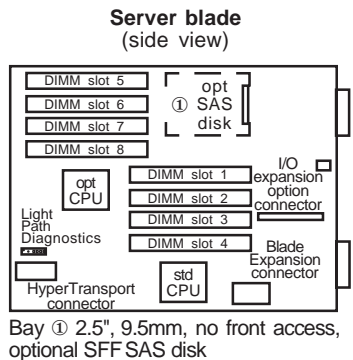
**LIMITED WARRANTY<sup>3</sup>**

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

IBM® Type-model	Qty x Processor <sup>1</sup>	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
7971-6AU	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
7971-21U	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

Positioning Processor(s) L2 Cache SMP support Implementation	<b>Ultra-dense, low power, dual socket, full performance modular computing platform with superior performance</b> Up to 2 x AMD Opteron 2000 Series Dual Core at up to 3.0GHz / simultaneously supports 32-bit and 64-bit computing <b>1MB L2 Cache per core, AMD Direct Connect Architecture</b> ensures lower latency I/O <b>2-way SMP</b> / 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	<b>1 or 2GB</b> std / 16GB max <sup>13</sup> (32GB max with 4GB DIMMS*) / two slots used / six slots available <b>PC5300</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), 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 <b>RAID-1, 1E &amp; 5</b> 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 <b>ServerWorks™ Chipset / HT2000 HyperTransport System I/O Controller</b> 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 / <b>HT1000 South Bridge</b> 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	<b>One legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)											
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	<b>IBM Baseboard Management Controller (BMC) / H8S2166</b> / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module											
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)											
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode											
Software ship group 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	25R8898
Dual Core AMD Opteron Processor Model 2212	25R8831
Dual Core AMD Opteron Processor Model 2216 HE	25R8899
Dual Core AMD Opteron Processor Model 2218	25R8897
Dual Core AMD Opteron Processor Model 2218 HE	44E5246
Dual Core AMD Opteron Processor Model 2220	40K1264
Dual Core AMD Opteron Processor Model 2222	44R4946
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
Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>	



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 WARRANTY<sup>3</sup>**

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9517)
  - 3 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9518)
  - 4 year IOR 9x5, 4 hr avg response (ServicePac part num 69P9521)
  - 4 year IOR 24x7, 4 hr avg response (ServicePac part num 69P9522)
  - 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

IBM® Type-model	Qty x Processor <sup>1</sup>	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
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)	<b>Ultra-dense, dual-socket, up to six-core, modular computing platform with superior performance</b> 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	<b>2MB or 3MB L2 Cache / AMD Direct Connect Architecture</b> ensures lower latency I/O											
SMP support Implementation	<b>2-way SMP</b> / 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	<b>2x1GB or 4x2GB</b> std / 64GB max <sup>13</sup> / two or four slots used / four or six slots available / <b>PC2-5300</b> 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (std) / <b>PC2-6400</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), hardware scrubbing											
SAS disk controller SAS disk bays	<b>LSI Logic®1064E SAS controller</b> / 1.5/3.0 Gb/s / PCI-Express / on planar / supports <b>RAID-1</b> / 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 <b>ServerWorks™ Chipset / HT2100 HyperTransport System I/O Controller</b> 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	<b>One legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)											
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	<b>IBM Baseboard Management Controller (BMC)</b> / 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		
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via Preboot DSA)						Four Core AMD Opteron Processor Model 2356			44R4961		
							Four Core AMD Opteron Processor Model 2376 HE			46M6880		
Security	Power-on password / administrator password / unattended boot / selectable boot / unattended start mode						Four Core AMD Opteron Processor Model 2384			46M6808		
							Six Core AMD Opteron Processor Model 2435			49Y4747		
Software ship group Cooling fans	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						2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit			46C0522		
							4GB (2x2GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM Kit			46C0512		
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						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			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

Other options at [ibm.com/products/us](http://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
- ◇ 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 server<sup>13</sup>:  
 292GB with two 146GB SAS disks*

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

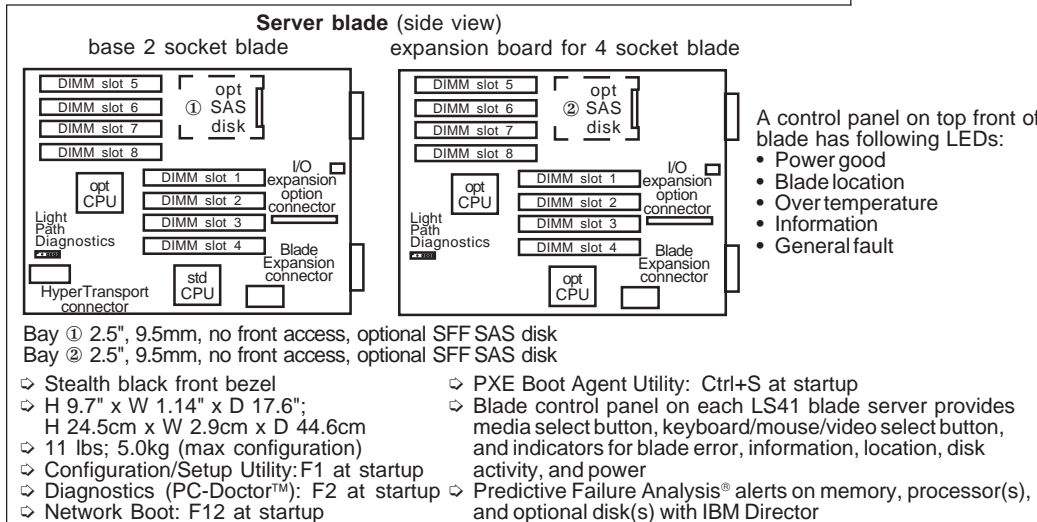
- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® part 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>
- 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

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

IBM® Type-model	Qty x Processor <sup>1</sup>	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
7972-6AU	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

Positioning Processor(s) L2 Cache SMP support Implementation	<b>Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance</b> Up to 4 x AMD Opteron 8000 Series Dual Core at up to 2.6GHz / simultaneously supports 32-bit and 64-bit computing <b>1MB L2 Cache per core, AMD Direct Connect Architecture</b> ensures lower latency I/O <b>2 or 4-way SMP</b> / 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	<b>1, 2 or 4GB</b> std / 16GB max <sup>13</sup> with double socket blade / 32 GB max <sup>13</sup> with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / <b>PC5300</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), 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 <b>RAID 0, 1 / 5</b> supports <b>RAID-1, 1E &amp; 5</b> 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 <b>ServerWorks™ Chipset</b> / Up to two <b>HT2000 HyperTransport System I/O Controllers</b> 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 / <b>HT1000 South Bridge</b> 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	<b>Up to two legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)											
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	<b>IBM Baseboard Management Controller (BMC)</b> / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module											
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)											
Security	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 Dual Core AMD Opteron Processor Model 8212 Dual Core AMD Opteron Processor Model 8216HE Dual Core AMD Opteron Processor Model 8218 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*										25R8934 25R8932 25R8935 25R8933 39M5861 39M5864 39M5867 39M5870 26K5776 26K5777 39R7563 26K4841 39R8624 32R1923 26R0890 39Y9186	



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

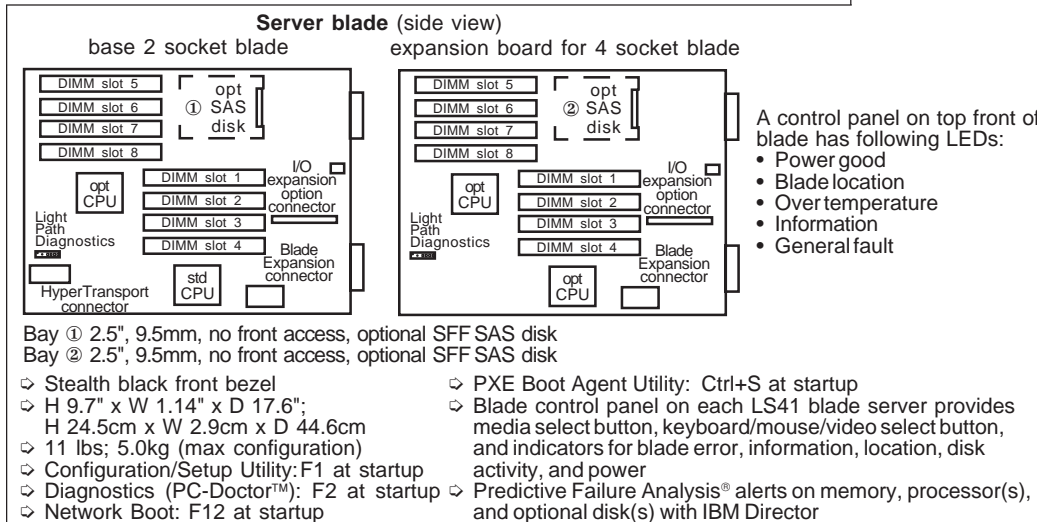
- ↪ 3 year parts and labor
- ↪ International Warranty Service<sup>3</sup>
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↪ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® 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>
- ↪ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

<sup>14</sup>4GB DIMMS support available December 2006

IBM® Type-model	Qty x Processor <sup>1</sup>	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
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
7972-61U	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

Positioning Processor(s) L2 Cache SMP support Implementation	<b>Ultra-dense, low power, dual or quad socket, full performance modular computing platform with superior performance</b> Up to 4 x AMD Opteron 8000 Series Dual Core at up to 3.0GHz / simultaneously supports 32-bit and 64-bit computing <b>1MB L2 Cache per core, AMD Direct Connect Architecture</b> ensures lower latency I/O <b>2 or 4-way SMP</b> / 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	<b>1, 2 or 4GB</b> std / 16GB max <sup>13</sup> with double socket blade / 32 GB max <sup>13</sup> with quad socket blade / (32/64GB max with 4GB DIMMS*) two or four slots used / six or twelve slots available / <b>PC5300</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), 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 <b>RAID 0, 1 /</b> supports <b>RAID-1, 1E &amp; 5</b> 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 <b>ServerWorks™ Chipset</b> / Up to two <b>HT2000 HyperTransport System I/O Controllers</b> 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 / <b>HT1000 South Bridge</b> 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	<b>Up to two legacy connector or PCI-Express connector for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)											
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	<b>IBM Baseboard Management Controller (BMC)</b> / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module											40K1265 44E5247 40K1266 44R4951 39M5861 39M5864 39M5867 39M5870 26K5776 26K5777 39R7563 26K4841 39R8624 32R1923 26R0890 39Y9186
Diagnostics	<b>Light Path Diagnostics™</b> (LED lights indicate failing component) and on-board diagnostics (via PC-Doctor in BIOS)											
Security	No security intrusion protection / Power-on password / administrator password / unattended boot / selectable boot / unattended start mode											
Software ship group	Documentation CD, Device Driver CD, ServerGuide CD											
Cooling fans	Uses cooling from BladeCenter (types 8677, 8720, 8730, 8852) / thermal sensors on each processor and BladeCenter modules and front panel											
Power supply Prerequisites	Uses power module(s) in BladeCenter (types 8677, 8720, 8730, 8852) Monitor, keyboard, mouse for setup; ethernet switch module, disk, BladeCenter (types 8677, 8720, 8730, 8852), operating system											
	Other options at <a href="http://ibm.com/pc/us/accessories">ibm.com/pc/us/accessories</a>											



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

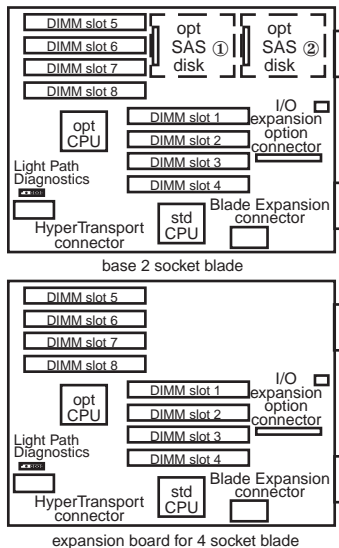
- ↪ 3 year parts and labor
- ↪ International Warranty Service<sup>3</sup>
- ↪ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ↪ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 4 hr avg response (ServicePac<sup>®</sup> partnum12x7014)
  - 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>
- ↪ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information



IBM® Type-model	Qty x Processor <sup>1</sup>	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
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

Positioning Processor(s) L2 Cache SMP support Implementation	<b>Ultra-dense, quad socket, full performance modular computing platform with superior performance</b> Up to 4 x AMD Opteron 8000 Series Quad Core at up to 2.7GHz / simultaneously supports 32-bit and 64-bit computing <b>512KB</b> L2 Cache per core, <b>AMD Direct Connect Architecture</b> ensures lower latency I/O <b>2 or 4-way SMP</b> / 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	<b>4x1GB or 8x2GB</b> std / 64GB max <sup>13</sup> / four or eight slots used / twelve or eight slots available / <b>PC2-5300</b> 667MHz registered 240-pin ECC DDR2 VLP SDRAM RDIMMs (std) / <b>PC2-6400</b> 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 / <b>Error Checking and Correcting (ECC)</b> via <b>16-bit Checksum Chipkill™</b> (corrects 1, 2, 3, or 4-bit errors on same chip and detects 2- through 8-bit errors contained in two chips), hardware scrubbing											
SAS disk controller	<b>LSI Logic®1064E SAS controller</b> / 1.5/3.0Gb/sec / PCI-Express / on planar / supports <b>RAID-1</b> / 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 <b>ServerWorks™ Chipset / HT2100 HyperTransport System I/O Controller</b> provides: PCI-Express links to Blade Storage Expansion connector and PCI-Express Switch to SAS and Ethernet controllers, HyperTransport bridge to HT1000 South Bridge / <b>HT 1000 South Bridge</b> 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 / <b>HT 2000 HyperTransport System I/O Controller</b> 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	<b>Two legacy connectors for I/O expansion options</b> / requires same interface modules in bays 3 and 4 of BladeCenter / all blades in a single BladeCenter must contain the same expansion card (or no expansion card)											
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	<b>IBM Baseboard Management Controller (BMC)</b> / H8S2166 / on blade / provides system and environmental monitoring, event recording, alert capability / RS-485 interface for intermanagement communication with BladeCenter Management module											
Diagnostics	<b>Light Path Diagnostics™</b> (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											
											Quad Core AMD Opteron Processor Model 8347HE	44X1552
											Quad Core AMD Opteron Processor Model 8356	44R4917
											LS42 Multi Processor Expansion Unit with 2 x 8380 processors	46M6817
											LS42 Multi Processor Expansion Unit with 2 x 8384 processors	44X1685
											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
											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
	Other options at <a href="http://ibm.com/products/us">ibm.com/products/us</a>											



- ◇ 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

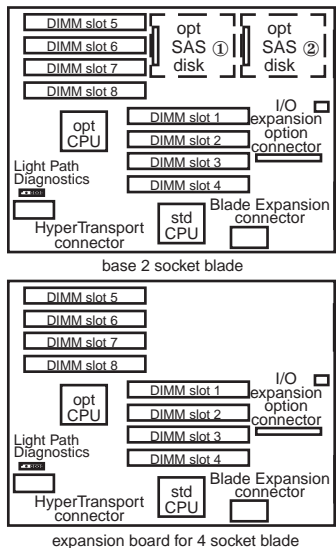
Maximum internal disk capacity for each LS42 blade server<sup>13</sup>:  
292GB with two 146GB SAS disks

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

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

IBM® Type-model	Qty x Processor <sup>1</sup>	Speed/Core	L2 Cache	Watts	Memory	Disk controller	Disk bays	Expansion Units	I/O slots	Mechanical	Ethernet	Available date
7902-3Lx	2 x Optron 8376	HE 2.3GHz/4C	2MB	55W	4GB	SAS	2 fixed	PCIeU/PEU2	up to 2	single slot blade	2 x Gb	Mar 2009
7902-61x	2 x Optron 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 Optron 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 Optron 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 Optron 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)	<b>Ultra-dense, up to 4 socket, full performance modular computing platform with superior performance</b> Up to 4 x AMD Optron 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	<b>512KB L2 Cache per core, AMD Direct Connect Architecture</b> ensures lower latency I/O 2 or 4-way SMP / up to four Optron 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	<b>4x1GB or 8x2GB std / 128GB max<sup>13</sup> / 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</b>											
SAS disk controller External storage	<b>LSI Logic® 1064E SAS controller / 1.5/3.0Gb/sec / PCI-Express / on planar / supports RAID-1 / no cables or external connector</b> Two fixed 2.5" SFF SAS disks 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) <b>ServerWorks™ Chipset / HT2100 HyperTransport System I/O Controller</b> provides: PCI-Express links to Blade Storage Expansion connector and PCI-Express Switch to SAS and Ethernet controllers, HyperTransport bridge to HT1000 South Bridge / <b>HT 1000 South Bridge</b> 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 / <b>HT 2000 HyperTransport System I/O Controller</b> 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	<b>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)</b>											
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	<b>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</b>											
Diagnostics	<b>Light Path Diagnostics™ (LED lights indicate failing component) and on-board diagnostics (via Preboot DSA)</b>											
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)

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 server<sup>13</sup>:  
292GB with two 146GB SAS disks

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

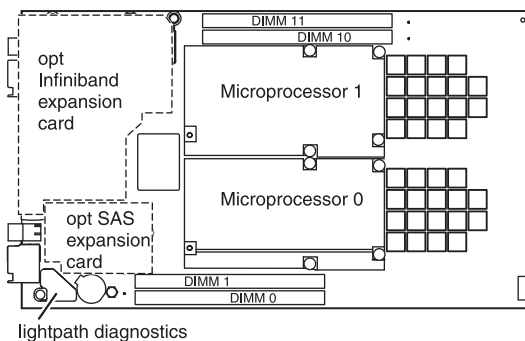
- ⇒ 3 year parts and labor
- ⇒ International Warranty Service<sup>3</sup>
- ⇒ On site, 8 am - 5 pm, Mon - Fri coverage excluding holidays, next business day response time<sup>7</sup>
- ⇒ On site service upgrade options (in eligible locations):<sup>7</sup>
  - 3 year IOR 9x5, 4 hr avg response (ServicePac® 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>
- ⇒ 24x7<sup>14</sup> toll-free support for warranty issues during the warranty period<sup>3</sup>

See footnotes for important warranty information

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

IBM® Type-model	Processor	GHz <sup>1</sup>	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	<b>Dual Gigabit</b> 10/100/1000 ethernet controller / <b>Broadcom® 5704S</b> 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	<b>IBM Integrated Baseboard Management Controller (BMC)</b> / BladeCenter Advanced Management Module Web interface / IPMI 1.5 / <b>IBM Active Energy Manager®</b> / IBM Director													
Diagnostics	<b>Light Path Diagnostics</b> (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											512 MB VLP DIMMs (Qty 2) as I/O Buffer Memory		39M5861
Power supply(s)	Uses power module(s) in BladeCenter chassis											Cisco 4x InfiniBand Adapter		32R1760
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)											SAS expansion card for IBM BladeCenter		39Y9190

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)
- 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

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

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

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

- 1 year parts and labor
- International Warranty Service<sup>3</sup>
- Customer Replaceable Unit (CRU) and On-site Service\*
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **24x7<sup>14</sup> telephone support for warranty issues during the warranty period<sup>3</sup>**

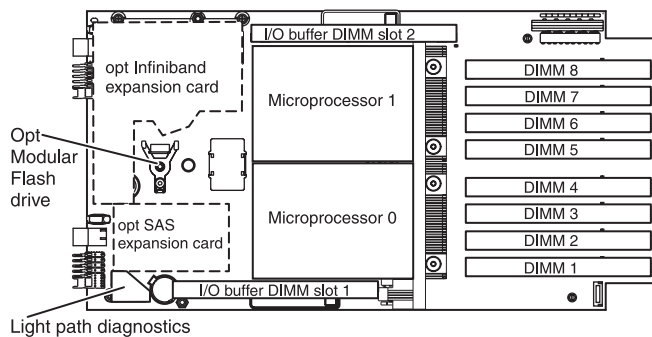
(\*) IBM will determine which type of warranty service is appropriate for the repair

IBM® Type-model	Processor	GHz <sup>1</sup>	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	<b>Dual Gigabit 10/100/1000 ethernet controller / Broadcom® 5704S</b> 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	<b>IBM Integrated Baseboard Management Controller (BMC) / BladeCenter Advanced Management Module Web interface / IPMI 1.5 / IBM Systems Director Active Energy Manager® / IBM Director</b>
Diagnostics	<b>Light Path Diagnostics</b> (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 WARRANTY<sup>3</sup>**

- 3 year parts and labor
- International Warranty Service<sup>3</sup>
- Customer Replaceable Unit (CRU) and On-site Service\*
- **On site, 8 am-5 pm, Mon-Fri excluding holidays, next business day response time**
- **24x7<sup>14</sup> telephone support for warranty issues during the warranty period<sup>3</sup>**

(\* ) 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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