IBM ⒠server *pSeries,*
IBM RS/6000 and IBM NUMA-Q
Facts and Features

October, 2000

Product Line	RS/6000[®]	RS/6000	RS/6000
Machine type	7043-150	7044-170	7044-270
System packaging	deskside	deskside	deskside
Microprocessor type	32-bit 604e	64-bit POWER3-II	64-bit POWER3-II
# of processors/system	1	1	1, 2, 3 or 4
Clock rates available	250 MHz / 375 MHz	333 MHz / 400 MHz/ 450 MHz	375 MHz
System memory (standard/maximum)	128MB / 1GB	256MB / 2GB	256MB / 16GB[a]
Data/instruction (L1) cache	32KB / 32KB	64KB / 32KB	64KB / 32KB[b]
Level 2 (L2) cache	1MB	1MB / 4MB / 8MB	4MB / 8MB[b]
Reliability, availability, serviceability			
Service processor	-	X	X
Hot-swappable disks (internal and external)	-	-	-
Dynamic CPU Deallocation	-	-	X
Hot-plug slots	-	-	-
Redundant hot-plug power	-	-	-
Redundant hot-plug cooling	-	-	-
NEBS3	-	-	-
Capacity			
PCI slots available	5 (32-bit)	6 (4 32-bit, 2 64-bit)	5 (2 32-bit, 3 64-bit)
PCI bus speed (MHz)	33	33 / 50	33 / 50
Disk/media bays	2 / 3	3 / 3	2 / 3
Minimum/maximum internal disk storage	9.1GB / 54.6GB	9.1GB / 145.6GB	9.1GB / 109.2GB
Storage interfaces			
Ultra SCSI SE and Ultra SCSI Differential	X	X	X
PCI 2-channel Ultra2 SCSI	X	X	X
PCI 4-channel Ultra3 SCSI RAID	X	X	X
SSA Advanced SerialRAID Plus	X	X	X
Gigabit Fibre Channel	-	X	X
Communications and connectivity			
EIA RS232D/EIA RS422A	X	X	X
Token-Ring 4/16 Mbps	X	X	X
4-port 10/100 Mbps Ethernet	X	X	X
10/100 Mbps Ethernet	X	X	X
Gigabit Ethernet (Fibre / UTP)	-	X / X	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X	X / X	X / X
ATM 155 Mbps (Fibre / UTP)	X / X	X / X	X / X
ATM 622 Mbps (Fibre)	-	X	X
ISDN	-	X	X
SP System Attachment	-	-	-
ESCON[®] Control Unit (host attach)[k]	-	-	-
ESCON Emulation (tape attach)[k]	-	-	-
HIPPI[k]	-	-	-
Digital Trunk Quad / Resource Adapter[k]	X / X	X / X	X / X
X.25[k]	X	X	X
SDLC	X	X	X
BSC	X	X	X
Graphics accelerators	GXT130P, 300P, 2000P, 3000P	GXT130P, 300P, 2000P, 3000P, 4000P, 6000P	GXT130P, 300P, 2000P, 3000P, 4000P, 6000P
Benchmarks *(see page 14)*	(250 / 375 MHz)	(333 / 400 / 450 MHz)	(1, 2, 3, 4-way)[p]
SPECweb99	-	- / 460 / -	2175 (4-way)
SPECint_base95	10.9 / 14.5	18.6 / 23.5 / -	22.7
SPECfp_base95	8.28 / 9.76	34.0 / 46.0 / -	50.7
SPECint_base2000	99.4 / -	177 / 239 / 286	247
SPECfp_base2000	90.8 / -	225 / 295 / 356	327
SPECint_base_rate95	-	-	-
SPECfp_base_rate95	-	-	-
SPECint_base_rate2000	-	-	-, 5.6, -, 11.2
SPECfp_base_rate2000	-	-	-, 7.0, -, 11.5
TPC-C: tmpC; $/tpmC	-	-	-
TPC-H: QphH (@ 300GB)	-	-	-
TPC-H: $/QphH (@ 300GB)	-	-	-
Relative OLTP performance	4.0 / 6.0	10.4 / 14.5 / 15.6	-, 51.0, -, 92.0

Product Line	RS/6000	IBM @server pSeries 640
Machine type	7046-B50	7026-B80
System packaging	rack drawer (2U)	rack drawer (5U)
Microprocessor type	32-bit 604e	64-bit POWER3-II
# of processors/system	1	1, 2, 3 or 4
Clock rates available	375 MHz	375 MHz
System memory (standard/maximum)	128MB / 1GB	256MB / 1GB[a]
Data/instruction (L1) cache	32KB / 32KB	64KB / 32KB[b]
Level 2 (L2) cache	1MB	4MB / 8MB[b]
Reliability, availability, serviceability		
Service processor	-	X
Hot-swappable disks (internal and external)	-	X
Dynamic CPU Deallocation	-	X
Hot-plug slots	-	-
Redundant hot-plug power	-	X
Redundant hot-plug cooling	-	X
NEBS3	-	X
Capacity		
PCI slots available	2 (32-bit)	5 (1 32-bit, 4 64-bit)
PCI bus speed (MHz)	33	33 / 50
Disk/media bays	2[h] / 2	5
Minimum/maximum internal disk storage	9.1GB / 109.2GB	9.1GB / 145.6GB
Storage interfaces		
Ultra SCSI SE and Ultra SCSI Differential	X	X
PCI 2-channel Ultra2 SCSI	X	X
PCI 4-channel Ultra3 SCSI RAID	X	X
SSA Advanced SerialRAID Plus	X	X
Gigabit Fibre Channel	-	X
Communications and connectivity		
EIA RS232D/EIA RS422A	X	X
Token-Ring 4/16 Mbps	X	X
4-port 10/100 Mbps Ethernet	X	X
10/100 Mbps Ethernet	X	X
Gigabit Ethernet (Fibre / UTP)	-	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X	X / X
ATM 155 Mbps (Fibre / UTP)	X / X	X / X
ATM 622 Mbps (Fibre)	X	X
ISDN	X	-
SP System Attachment	-	-
ESCON Control Unit (host attach)[k]	-	X
ESCON Emulation (tape attach)[k]	-	X
HIPPI[k]	-	-
Digital Trunk Quad / Resource Adapter[k]	-	X / X
X.25[k]	X	X
SDLC	X	X
BSC	X	X
Graphics accelerators	GXT130P	GXT130P
Benchmarks *(see page 14)*		(1, 2, 3, 4-way)[p]
SPECweb99	-	2175 (4-way)
SPECint_base95	14.5	22.7
SPECfp_base95	9.76	50.7
SPECint_base2000	-	247
SPECfp_base2000	-	327
SPECint_base_rate95	-	-
SPECfp_base_rate95	-	-
SPECint_base_rate2000	-	-, 5.6, -, 11.2
SPECfp_base_rate2000	-	-, 7.0, -, 11.5
TPC-C: tmpC; $/tpmC	-	-
TPC-H: QphH (@ 300GB)	-	-
TPC-H: $/QphH (@ 300GB)	-	-
Relative OLTP performance	6.0	-, 51.0, -, 92.0

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Product Line	RS/6000	RS/6000
Machine type	7025-F50	7025-F80
System packaging	deskside	deskside
Microprocessor type	32-bit 604e	64-bit RS64 III
# of processors/system	1, 2, 3 or 4	1, 2, 4 or 6
Clock rates available	332 MHz	450 MHz (1, 2, 4-way), 500 MHz (6-way)
System memory (standard/maximum)	128MB / 3GB[a]	512MB / 16GB[a,n]
Data/instruction (L1) cache	32KB / 32KB[b]	128KB / 128KB[b]
Level 2 (L2) cache	256KB[b]	2MB (1-way) / 4MB (2, 4, 6-way)[b]
Reliability, availability, serviceability		
Service processor	X	X
Hot-swappable disks (internal and external)	X	X
Dynamic CPU Deallocation	-	X
Hot-plug slots	-	X
Redundant hot-plug power	-	O
Redundant hot-plug cooling	-	O
NEBS3	-	-
Capacity		
PCI slots available	7 (5 32-bit, 2 64-bit) + 2 ISA (32-bit)	10 (64-bit)
PCI bus speed (MHz)	33 / 50	33 / 66
Disk/media bays	18 / 4	14 / 3
Minimum/maximum internal disk storage	9.1GB / 345.8GB	9.1GB / 509.6GB
Storage interfaces		
Ultra SCSI SE and Ultra SCSI Differential	X	X
PCI 2-channel Ultra2 SCSI	X	X
PCI 4-channel Ultra3 SCSI RAID	X	X
SSA Advanced SerialRAID Plus	X	X
Gigabit Fibre Channel	X	X
Communications and connectivity		
EIA RS232D/EIA RS422A	X	X
Token-Ring 4/16 Mbps	X	X
4-port 10/100 Mbps Ethernet	X	-
10/100 Mbps Ethernet	X	X
Gigabit Ethernet (Fibre / UTP)	X / X	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X	X / X
ATM 155 Mbps (Fibre / UTP)	X / X	X / X
ATM 622 Mbps (Fibre)	X	X
ISDN	X	X
SP System Attachment	-	-
ESCON Control Unit (host attach)[k]	X	X
ESCON Emulation (tape attach)[k]	X	X
HIPPI[k]	X	X
Digital Trunk Quad / Resource Adapter[k]	X / X	X / X
X.25[k]	X	X
SDLC	X	X
BSC	X	X
Graphics accelerators	GXT130P	GXT130P
Benchmarks *(see page 14)*	(1, 2, 3, 4-way)	(1, 2, 4, 6-way)
SPECweb99	6716 (4-way) SPECweb96	-
SPECint_base95	14.0	18.7
SPECfp_base95	12.1	24.8
SPECint_base2000	-	225
SPECfp_base2000	-	205
SPECint_base_rate95	124, 245, 365, 485	168, -, 674, 1118
SPECfp_base_rate95	109, 206, 292, 364	223, -, 821, 1135
SPECint_base_rate2000	-	2.62, -, 10.8, 17.3
SPECfp_base_rate2000	-	2.38, -, 9.26, 13.0
TPC-C: tmpC; $/tpmC	9,853.13, 65.00 (4-way)	33,571.39, 58.94 (6-way)
TPC-H: QphH (@ 300GB)	-	-
TPC-H: $/QphH (@ 300GB)	-	-
Relative OLTP performance	10.0, 17.9, 25.2, 32.8	23.0, 50.0, 87.7, 111.9

Product Line	RS/6000	RS/6000
Machine type	7026-H70	7026-H80
System packaging	rack drawer (8U)	rack drawer (5U)
Microprocessor type	64-bit RS64 II	64-bit RS64 III
# of processors/system	1, 2, 3 or 4	1, 2, 4 or 6
Clock rates available	340 MHz	450 MHz (1, 2, 4-way), 500 MHz (6-way)
System memory (standard/maximum)	128MB / 8GB[a]	512MB / 16GB[a,n]
Data/instruction (L1) cache	64KB / 64KB[b]	128KB / 128KB[b]
Level 2 (L2) cache	4MB[b]	2MB (1-way) / 4MB (2, 4, 6-way)[b]
Reliability, availability, serviceability		
Service processor	X	X
Hot-swappable disks (internal and external)	X	External only
Dynamic CPU Deallocation	-	X
Hot-plug slots	-	X
Redundant hot-plug power	O	O
Redundant hot-plug cooling	X	X
NEBS3	X	X
Capacity		
PCI slots available	8 (4 32-bit, 4 64-bit)	28 (8 32-bit, 20 64-bit)
PCI bus speed (MHz)	33 / 50	33 / 66
Disk/media bays	13 / 3	2 / 4
Minimum/maximum internal disk storage	9.1GB / 254.8GB	0 / 36.4GB
Storage interfaces		
Ultra SCSI SE and Ultra SCSI Differential	X	X
PCI 2-channel Ultra2 SCSI	X	X
PCI 4-channel Ultra3 SCSI RAID	X	X
SSA Advanced SerialRAID Plus	X	X
Gigabit Fibre Channel	X	X
Communications and connectivity		
EIA RS232D/EIA RS422A	X	X
Token-Ring 4/16 Mbps	X	X
4-port 10/100 Mbps Ethernet	X	-
10/100 Mbps Ethernet	X	X
Gigabit Ethernet (Fibre / UTP)	X / X	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X	X / X
ATM 155 Mbps (Fibre / UTP)	X / X	X / X
ATM 622 Mbps (Fibre)	X	X
ISDN	X	X
SP System Attachment	-	-
ESCON Control Unit (host attach)[k]	X	X
ESCON Emulation (tape attach)[k]	X	X
HIPPI[k]	X	X
Digital Trunk Quad / Resource Adapter[k]	X / X	X / X
X.25[k]	X	X
SDLC	X	X
BSC	X	X
Graphics accelerators	GXT130P	GXT130P
Benchmarks *(see page 14)*	(1, 2, 3, 4-way)	(1, 2, 4, 6-way)
SPECweb99	11,774 (4-way) SPECweb96	-
SPECint_base95	13.7	18.7
SPECfp_base95	20.2	24.8
SPECint_base2000	168	225
SPECfp_base2000	-	205
SPECint_base_rate95	-	168, -, 674, 1118
SPECfp_base_rate95	-	223, -, 821, 1135
SPECint_base_rate2000	-	2.62, -, 10.8, 17.3
SPECfp_base_rate2000	-	2.38, -, 9.26, 13.0
TPC-C: tmpC; $/tpmC	17,133.73, 78.50 (4-way)	-
TPC-H: QphH (@ 300GB)	-	-
TPC-H: $/QphH (@ 300GB)	-	-
Relative OLTP performance	16.7, 31.9, 44.5, 57.1	23.0, 50.0, 87.7, 111.9

Product Line	RS/6000	RS/6000
Machine type	7026-M80	7017-S80
System packaging	rack drawer (8U)	frame
Microprocessor type	64-bit RS64 III	64-bit RS64 III, RS64 IV[j]
# of processors/system	2, 4, 6 or 8	6, 12, 18 or 24
Clock rates available	500 MHz	450 MHz, 600 MHz[j]
System memory (standard/maximum)	1GB / 32GB[a]	2GB / 96GB[a]
Data/instruction (L1) cache	128KB / 128KB[b]	128KB / 128KB[b]
Level 2 (L2) cache	4MB[b]	8MB / 16MB[b]
Reliability, availability, serviceability		
Service processor	X	X
Hot-swappable disks (internal and external)	External only	X
Dynamic CPU Deallocation	X	X
Hot-plug slots	X	-
Redundant hot-plug power	X	X
Redundant hot-plug cooling	X	X
-	X	-
Capacity		
PCI slots available	56 (16 32-bit, 40 64-bit)	53 (33 32-bit, 20 64-bit)
PCI bus speed (MHz)	33 / 66	33
Disk/media bays	2 / 8	48 / 8
Minimum/maximum internal disk storage	0 / 36.4GB	9.1GB / 873.6GB
Storage interfaces		
Ultra SCSI SE and Ultra SCSI Differential	X	X
PCI 2-channel Ultra2 SCSI	X	X
PCI 4-channel Ultra3 SCSI RAID	X	-
SSA Advanced SerialRAID Plus	X	X
Gigabit Fibre Channel	X	X
Communications and connectivity		
EIA RS232D/EIA RS422A	X	X
Token-Ring 4/16 Mbps	X	X
4-port 10/100 Mbps Ethernet	-	-
10/100 Mbps Ethernet	X	X
Gigabit Ethernet (Fibre / UTP)	X / X	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X	X / X
ATM 155 Mbps (Fibre / UTP)	X / X	X / X
ATM 622 Mbps (Fibre)	X	X
ISDN	X	X
SP System Attachment	-	X
ESCON Control Unit (host attach)[k]	X	X
ESCON Emulation (tape attach)[k]	X	X
HIPPI[k]	X	-
Digital Trunk Quad / Resource Adapter[k]	X / -	-
X.25[k]	X	X
SDLC	X	X
BSC	X	X
Graphics accelerators	GXT130P	GXT130P
Benchmarks *(see page 14)*	(2, 4, 6, 8-way)	(6, 12, 18, 24-way)
SPECweb99	3,216 (8-way)	40,161 (12-way) SPECweb96[r]
SPECint_base95	20.7	-
SPECfp_base95	28.5	-
SPECint_base2000	264	-
SPECfp_base2000	243	-
SPECint_base_rate95	-, -, -, 1489	-
SPECfp_base_rate95	-, -, -, 1910	-
SPECint_base_rate2000	-, -, -, 24.0	-
SPECfp_base_rate2000	-, -, -, 20.6	-
TPC-C: tmpC; $/tpmC	66,750.27, 45.46 (8-way)	135,815.70, 52.70 (24-way)[r]
TPC-H: QphH (@ 300GB)	-	-
TPC-H: $/QphH (@ 300GB)	-	-
Relative OLTP performance	65.0, 115.3, 169.3, 222.5	161.7, 306.7, 428.7, 533.3[r] / 219.0, 416.0, 583.3, 736.0[q]

Product Line	IBM @server pSeries 680
Machine type	7017-S85
System packaging	frame
Microprocessor type	64-bit RS64 IV
# of processors/system	6, 12, 18 or 24
Clock rates available	600 MHz
System memory (standard/maximum)	4GB / 96GB[a]
Data/instruction (L1) cache	128KB / 128KB[b]
Level 2 (L2) cache	16MB[b]
Reliability, availability, serviceability	
Service processor	X
Hot-swappable disks (internal and external)	X
Dynamic CPU Deallocation	X
Hot-plug slots	-
Redundant hot-plug power	X
Redundant hot-plug cooling	X
NEBS3	-
Capacity	
PCI slots available	53 (33 32-bit, 20 64-bit)
PCI bus speed (MHz)	33
Disk/media bays	48 / 8
Minimum/maximum internal disk storage	9.1GB / 873.6GB
Storage interfaces	
Ultra SCSI SE and Ultra SCSI Differential	X
PCI 2-channel Ultra2 SCSI	X
PCI 4-channel Ultra3 SCSI RAID	-
SSA Advanced SerialRAID Plus	X
Gigabit Fibre Channel	X
Communications and connectivity	
EIA RS232D/EIA RS422A	X
Token-Ring 4/16 Mbps	X
4-port 10/100 Mbps Ethernet	-
10/100 Mbps Ethernet	X
Gigabit Ethernet (Fibre / UTP)	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X
ATM 155 Mbps (Fibre / UTP)	X / X
ATM 622 Mbps (Fibre)	X
ISDN	-
SP System Attachment	X
ESCON Control Unit (host attach)[k]	X
ESCON Emulation (tape attach)[k]	X
HIPPI[k]	-
Digital Trunk Quad / Resource Adapter[k]	-
X.25[k]	X
SDLC	X
BSC	X
Graphics accelerators	GXT130P
Benchmarks (see page 14)	(6, 12, 18, 24-way)
SPECweb99	7,288 (12-way)
SPECint_base95	-
SPECfp_base95	-
SPECint_base2000	-
SPECfp_base2000	-
SPECint_base_rate95	-
SPECfp_base_rate95	-
SPECint_base_rate2000	-
SPECfp_base_rate2000	-
TPC-C: tmpC; $/tpmC	220,807.27, 43.30 (24-way)
TPC-H: QphH (@ 300GB)	-
TPC-H: $/QphH (@ 300GB)	-
Relative OLTP performance	219.0, 416.0, 583.3, 736.0

Product Line	RS/6000 SP™	RS/6000 SP	RS/6000 SP
Machine type	9076	9076	9076
Node type	375MHz POWER3 SMP Thin[e]	375MHz POWER3 SMP Wide[e]	375MHz POWER3 SMP High[e]
System packaging	frame	frame	frame
Microprocessor type	64-bit POWER3-II	64-bit POWER3-II	64-bit POWER3-II
Minimum/maximum of each node type / system	1/128[f]	1/128[f]	1/128[f]
# of processors/system	2 or 4	2 or 4	4, 8, 12 or 16
Clock rates available	375 MHz	375 MHz	375 MHz
System memory (standard/maximum)	256MB / 16GB[a]	256MB / 16GB[a]	1GB / 64GB[a]
Data/instruction (L1) cache	64KB / 32KB[b]	64KB / 32KB[b]	64KB / 32KB[b]
Level 2 (L2) cache	8MB[b]	8MB[b]	8MB[b]
Reliability, availability, serviceability			
Service processor	X[d]	X[d]	X[d]
Hot-swappable disks (internal and external)	External only	External only	X[g]
Dynamic CPU Deallocation	X	X	X
Hot-plug slots	-	-	X[g]
Redundant hot-plug power	-	-	-
Redundant hot-plug cooling	-	-	-
NEBS3	-	-	-
Capacity			
PCI slots available	2 (32-bit)	10 (2 32-bit, 8 64-bit)	53 (1 32-bit, 52 64-bit)
PCI bus speed (MHz)	33	33	33
Disk/media bays	2	4	2 (26[g])
Minimum/maximum internal disk storage	0 / 36.4GB	0 / 109.2GB	0 / 946.4GB[g]
Storage interfaces			
Ultra SCSI SE and Ultra SCSI Differential	X	X	X
PCI 2-channel Ultra2 SCSI	X	X	X
PCI 4-channel Ultra3 SCSI RAID	-	-	-
SSA Advanced SerialRAID Plus	X	X	X
Gigabit Fibre Channel	X	X	X
Communications and connectivity			
EIA RS232D/EIA RS422A	X	X	X
Token-Ring 4/16 Mbps	X	X	X
4-port 10/100 Mbps Ethernet	X	X	X
10/100 Mbps Ethernet	X	X	X
Gigabit Ethernet (Fibre / UTP)	X / X	X / X	X / X
FDDI 100 Mbps (Fibre / UTP)	X / X	X / X	X / X
ATM 155 Mbps (Fibre / UTP)	X / X	X / X	X / X
ATM 622 Mbps (Fibre)	X	X	X
ISDN	-	-	-
SP System Attachment	-	-	-
ESCON Control Unit (host attach)[k]	X	X	X
ESCON Emulation (tape attach)[k]	X	X	X
HIPPI[k]	X	X	X
Digital Trunk Quad / Resource Adapter[k]	X / X	X / X	X / X
X.25[k]	X	X	X
SDLC	X	X	X
BSC	X	X	X
Graphics accelerators	-	-	-
Benchmarks *(see page 14)*	(2, 4-way)	(2, 4-way)	(4, 8, 2, 16-way)
SPECweb99	-	-	-
SPECint_base95	22.6	22.6	21.8
SPECfp_base95	47.1	47.1	48.8
SPECint_base2000	248	248	229
SPECfp_base2000	330	330	322
SPECint_base_rate95	407, 812	407, 812	786, 1569, 2345, 3121
SPECfp_base_rate95	804, 1359	804, 1359	1670, 3290, 4832, 6202
SPECint_base_rate2000	-	-	10.6, 21.0, 31.4, 41.7
SPECfp_base_rate2000	-	-	14.1, 27.0, 39.0, 49.7
TPC-C: tmpC; $/tpmC	-	-	-
TPC-H: QphH (@ 1TB)	-	12,866.8 (32 nodes)	-
TPC-H: $/QphH (@ 1TB)	-	670.00 (32 nodes)	-
Relative OLTP performance	44.0, 67.7	44.0, 80.0	81.7, 160.3, 242.3, 319.3

Product Line	NUMA-Q	NUMA-Q
Model	E330	E410
System packaging	frame	frame
Microprocessor type	Intel Pentium® III Xeon	Intel Pentium III Xeon
System architecture	cc-NUMA	cc-NUMA
Processors per quad	4	4
# quads/system	1 to 16	1 to 16
# processors/system	4 to 64	4 to 64
Clock rates available (standard/option)	550 MHz (core speed)[c]	700 MHz
Quad interconnect: value	2	2
Quad interconnect: expandable (SCI)	2 to 16	2 to 16
# of systems per cluster (minimum/maximum)	2 / 4	2 / 4
System memory (standard/maximum)	1GB / 64GB[a]	1GB / 64GB[a]
Data/instruction (L1) cache	32KB[b]	32KB[b]
Level 2 (L2) cache	512KB, 2MB[b]	1MB, 2MB[b]
Interconnect cache options	>4GB memory/quad: 128MB cache expander required	>4GB memory/quad: 128MB cache expander required
Reliability, availability, serviceability		
Service processor	X	X
Automatic reboot	X	X
Hot-swappable I/O fabric	X	X
Clusters rolling upgrades	X	X
Capacity		
PCI slots available per system	112 (64-bit)	112 (64-bit)
PCI channels/buses per quad	2 at 266MB/sec (64-bit)	2 at 266MB/sec (64-bit)
Maximum internal disk per system (4 x 36)	144GB	144GB
Maximum external disk	582TB	582TB
Storage interfaces		
SCSI-2	X	X
Fibre Channel direct-connect	X	X
Fibre Channel switch	X	X
Communications and connectivity		
Token-Ring 4/10/100 Mbps	X	X
4-port 10/100 Mbps Ethernet	X	X
Single port Ethernet 10/100 Mbps	X	X
Gigabit Ethernet	X	X
FDDI (64-bit)	X	X
ATM	X	X
ESCON Emulation (tape attach)	X	X
Benchmarks *(see page 14)*		
TPC-C: tpmC; $/tpmC	93,900[m], 131.67 (16 quads)	-
TPC-H: QphH (@ 300GB)	-	7,334.4 (16 quads)
TPC-H: $/QphH (@ 300GB)	-	612.00 (16 quads)

Footnotes

X = Supported
O = Optionally Available
N/A = Not Applicable
§ = Statement of Direction
a Shared memory
b Per processor
c Actual speed: 495 MHz
d Via control workstation and PSSP software
e Node types can be intermixed on system
f   Up to 512 available via special order
g With SP Expansion I/O units
h Third disk bay available via RPQ
j   Upgrades only
k Requires additional software; check on availability
m Using a NUMACenter™ environment
n 256MB/8GB on 1-way system
p Using 8MB of L2 cache
q Using 600 MHz processors
r   Using 450 MHz processors

I/O device options	RS/6000 150	RS/6000 170/270	RS/6000 B50	pSeries 640	RS/6000 F50/F80/H70/ H80/M80/S80	pSeries 680	RS/6000 SP
Disk drives and subsystems							
7203-001 Portable Disk Drive	X	X	X	-	X*	X*	-
7204-409/419 External Disk Drive	X	X	-	X	X*	X*	-
7133-D40/T40 Serial Disk System	X	X	X	X	X	X	X
2102-D00 Expandable Storage Unit	-	X	X	-	X*	X*	-
2102-F10 Fibre Channel RAID Storage Server	-	X	X	-	X*	X*	-
2104-DL1/TL1 Expandable Storage Plus	X	X	X	X	X	X	X
2104-DU3/TU3 Expandable Storage Plus	X	X	X	X	X	X	X
2105-F10/F20 Enterprise Storage Server	-	X	-	X	X	X	X
Fibre Channel switches							
2032-001 Enterprise Fibre Channel Director	-	X	-	X	X	X	X
2109-S08/S16 SAN Fiber Channel Switch	-	X	-	X	X	X	X
Optical drives and libraries							
3995-Cxx Optical Library	X	X	-	X	X	X	X
7210-020 CD-ROM Drive	X	X	-	X	X	X	X
Tape drives and libraries							
7205-311 DLT Tape Drive	X	X	X	X	X*	X*	-
7206-005 4 mm Tape Drive	X	X	-	X	X*	X*	-
7206-110 4 mm Tape Drive	X	X	X	X	X	X	X
7207-122 4GB 1/4-inch Tape Drive	X	X	X	X	X	X	X
7208-341 8 mm Tape Drive	X	X	X	X	X*	X*	-
3490E-Fxx 1/2-inch Tape Subsystem (18/36-track)	X	X	X	X	X	X	X
3494-L12/L10/D12/D10 Magstar Tape Library	X	X	-	X	X	X	X
3494-B18 Magstar® Virtual Tape Server	-	-	-	-	X	X	X
3570-Cxx Magstar MP Tape Subsystem	X	X	X	X	X	X	X
3575 Magstar MP Tape Library Dataserver	X	X	X	X	X	X	X
3590-E11/B11/C12 Magstar Tape Drive	X	X	X	X	X	X	X
7331-305 8 mm Tape Library	X	X	X	X	X	X	X
7332-110 4 mm DDS-3 Tape Autoloader	X	X	-	X	X*	X*	-
7337-305/306 DLT Tape Library	X	X	X	X	X	X	X
12GB/24GB 4 mm Tape Drive (internal)	X	X	-	X	X*	X*	-
5GB/10GB 8 mm Tape Drive (internal)	-	-	-	-	X	X	X
20/40GB 8 mm Tape Drive (internal)	X	X	-	X	X	X	X
Communications subsystems							
8361-110 IBM Network Station ™	X	X	X	X	X	X	-

X = *Available*
* Not supported when a pSeries 680 or RS/6000 S80 is attached to the RS/6000 SP.
Note: For the devices listed, not all models are supported on all systems. For more information, contact your IBM marketing representative or IBM Business Partner

I/O device options	NUMA-Q E330/E410
Disk drives and subsystems	
2105-F10/F20 Enterprise Storage Server	X
EMC Symmetrix 4.8	X
Hitachi Data Systems 5800	X
Hitachi Data Systems 5800lite/7700E	X*
Fibre Channel SAN devices	
Brocade 8-port Fibre Channel Switch	X
Brocade 16-port Fibre Channel Switch	X
Fibre to SCSI Bridge	X
Optical drives and libraries	
8W/20R CD-Recordable (internal)	X
Tape drives and libraries	
IBM 3590 Tape Drive	X
IBM 3494 Tape Drive	X
DLT 7000 Table-top	X
Qualstar GCR (9-track)	X*
STK 9730/9710/9740	X
STK 9840 (SCSI)	X*
STK 9490 "Timberline"	X*
STK SD-3 "Redwood"	X*
QIC525 Tape Drive (internal)	X

X = Available
* Supported by NUMA-Q Non Standard Business organization

RS/6000 graphics accelerators

	150	170	270
POWER GXT130P - 2D	X	X	X
POWER GXT300P - 2D/3D (Softgraphics)	X	X	X
POWER GXT2000P - 2D/3D	X	X	X
POWER GXT3000P - 2D/3D	X	X	X
POWER GXT4000P - 2D/3D	-	X	X
POWER GXT6000P - 2D/3D	-	X	X

RS/6000 workstation performance

	150 (375 MHz)	150 (333 MHz)		170 (400 MHz)		170 (450 MHz)		270 (2-way; 4MB L2)		270 (4-way; 4MB L2)	
Graphics accelerators	GXT2000P	GXT4000P/ GXT6000P		GXT4000P/ GXT6000P		GXT4000P/ GXT6000P		GXT4000P/ GXT6000P		GXT4000P/ GXT6000P	
Xmark93	42.2	71.0	70.6	79.1	79.4	84.2	84.2	77.4	77.1	77.4	77.1
PLBwire93	253	583	943	726	1120	821	1190	1120	1270	1370	1180
PLBsurf93	458	887	1290	1050	1490	1180	1640	1440	1790	1830	1900
ProCDRS-03	6.6	14.9	31.6	17.8	33.1	19.5	33.2	17.0	32.8	17.0	32.8
DX-06	3.68	6.87	14.6	8.30	17.0	9.34	17.9	7.91	15.9	7.91	15.9
DRV-07	2.13	3.18	13.3	3.67	15.1	4.23	15.3	3.60	14.6	3.60	14.6
Light-04	1.16	1.73	3.22	2.13	3.80	2.35	4.05	1.97	3.61	1.97	3.61
AWadvs-04	15.0	24.1	59.0	28.9	67.0	32.5	71.4	27.6	65.0	27.6	65.0

System software

	150	170	270	B50	p640	F50	F80
Operating system support							
AIX® 4.3 (5765-C34)[1]	4.3.2+	4.3.3	4.3.3	4.3.3	4.3.3	X	4.3.3
LINUX®	X[2]	-	-	X[2]	X[3]	X[2]	-
HACMP	X	X	X	-	X	X	X

	H70	H80	M80	S80	p680
Operating system support					
AIX 4.3[1]	4.3.2+	4.3.3	4.3.3	4.3.3	4.3.3
Linux	-	-	-	-	-
HACMP	X	X	X	X	X

	SP 375 MHz POWER3 SMP Thin	SP 375 MHz POWER3 SMP Wide	SP 375 MHz POWER3 SMP High	NUMA-Q
Operating system support				
AIX 4.3[1]	4.3.3	4.3.3	4.3.3	-
Linux	-	-	-	-
HACMP	X	X	X	-
DYNIX/ptx®	-	-	-	X
Mixed mode	-	-	-	X
ptx/CLUSTERS™	-	-	-	X

X = Available or standard feature
1 *AIX – unlimited user license*
2 *Enabled*
3 *PowerPC distribution*

IBM services

IBM services provide the capabilities and solutions needed to manage virtually every aspect of an open systems environment and at any level chosen. These services complement the support already included with a pSeries, RS/6000 and NUMA-Q system. IBM world-class services and support allow you to better manage resources and focus on what matters most – your business.

IBM customer financing provides an additional incentive . An array of attractive and flexible financing programs eases the acquisition of new technology and helps protect from the risk of obsolescence. Financing may be available to credit-qualified customers. Rates are based on credit rating, financing terms, and other options. Other restrictions may apply.

Project support services

- Operating system porting/conversion
- Operating system migration assistance
- Systems integration
- IBM and non-IBM software customization
- IBM application development
- Site planning services

Continuing support services

- Customer Support Center services
  - Electronic/voice
  - IBM and non-IBM hardware and software
- On-site software maintenance support
- Capacity planning
- Maintenance services, including multivendor environment
- Technical/application specialists
- Network custom services
- Education

Benchmark notes:

Values shown in the performance benchmarks section were derived using particular, well-configured, development-level computer systems, and used 32-bit applications and external cache if external cache is supported on the system. All performance benchmark values and estimates are provided "AS IS" and no warranties or guarantees are expressed or implied by IBM. Buyers should consult other sources of information, including system benchmarks, to evaluate the performance of a system they are considering. Actual system performance may vary and is dependent upon many factors including system hardware configuration and software design and configuration. IBM recommends application-oriented testing for performance predictions. Additional information about the performance benchmarks, values, and systems tested is available from your IBM marketing representative or IBM Authorized Reseller or access the following on the Web:

SPEC http://www.spec.org

TPC http://www.tpc.org

Unless otherwise indicated, new or updated system benchmarks were conducted using AIX Version 4.3.

tpmC: TPC Benchmark C throughput measured as the average number of transactions processed per minute during a valid TPC-C configuration run of at least twenty minutes.

$/tpmC: TPC Benchmark C price-performance ratio reflects the estimated five year total cost of ownership for system hardware, software, and maintenance divided by the tpmC for the system.

QppH is the power metric of TPC-H and is based on a geometric mean of the 17 TPC-H queries, the insert test and the delete test. It measures the ability of the system to give a single user the best possible response time by harnessing all available resources. QppH is scaled based on database size from 30GB to 1TB.

QthH is the throughput metric of TPC-H and is a classical throughput measure characterizing the ability of the system to support a multiuser workload in a balanced way. A number of query users is chosen, each of which must execute the full set of 17 queries in a different order. In the background, there is an update stream that runs a series of insert/delete operations. QthH is scaled based on the database size from 30GB to 1TB.

QphH is the geometric mean of the power tests (QppH) and the throughput tests (QthH).

$/QphH: Price-performance metric for the TPC-H benchmark where QphH is the geometric mean of QppH and QthH. The price reflects the estimated five year cost of ownership for the tested hardware configuration, software and maintenance.

Relative OLTP performance: Estimate of commercial processing performance derived from an IBM analytical model which simulates some of the system's operations such as CPU, cache and memory. The model does not simulate disk or network I/O operations. Although general database and operating system parameters are used, the model does not reflect specific databases or AIX version or releases. The model assumes the use of 32-bit applications. An IBM RS/6000 Model 250 is the baseline reference system and has a value of 1.0. Although Relative OLTP may be used to compare estimated commercial processing performance, actual system performance may vary and is dependent upon many factors, including system hardware configuration and software design and configuration.

More information

- Contact your IBM marketing representative or IBM Business Partner.
- Access **ibm.com**/servers/unix on the Internet to get to the IBM Web Servers Products and Services page[1] on IBM's World Wide Web server, and then select the appropriate hardware or software option.
- Product announcement letters containing more details on hardware and software offerings are available at **ibm.com**/ibmlink.
- Benchmark and performance information is available at:
  ibm.com/servers/eserver/pseries/ hardware/system_perf.html and
  ibm.com/rs6000/hardware/graphics_perf.html.

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