



# IBM Power Systems Facts and Features

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The following notes apply to the following Power Systems BladeCenter through Power 595 tables

X	Standard; Supported
Optional	Optionally Available; Supported
- or N/A	Not Applicable
P	Processor Capacity Upgrade on Demand option – permanent processor activation
M	Memory Capacity Upgrade on Demand option – permanent memory activation
T	Trial Capacity on Demand option
OO	On/Off Capacity on Demand for processors and memory option – temporary activation
U	Utility Capacity on Demand for processors option – temporary activation
SOD	Statement of General Direction announced
SLES	SUSE Linux Enterprise Server
RHEL	Red Hat Enterprise Linux

e	The value listed is unconstrained CPW (there is sufficient I/O such that the processor would be the first constrained resource)
h	9407-M15 is 1-core server; 9408-M25 is a 2-core server with a minimum of one activation
k	9409-M50 is a 4.2 GHz 4-core server with a minimum of one activation
p	Not all EnergyScale functions are available on every server.
v	Non-Express configurations need not have internal disk storage
w	Requires one year of VIOS SWMA
*	Full benchmark results are located at <a href="http://ibm.com/systems/power/hardware/reports/system_perf.html">ibm.com/systems/power/hardware/reports/system_perf.html</a>

## BladeCenter

Product Line	IBM BladeCenter® JS12 Express	IBM BladeCenter JS22 Express
Machine type	7998-60X	7998-61X
System packaging	Chassis mount	Chassis mount
<b>Chassis type supported</b>		
BladeCenter E	X	-
BladeCenter T	X	-
BladeCenter H	X	X
BladeCenter HT	X	X
BladeCenter S	X	X
Chassis slots required	1	1
Microprocessor type	64-bit IBM POWER6™	64-bit POWER6
# of processor cores/blade	2	4
Clock rates available	3.8 GHz	4.0 GHz
System memory (minimum - maximum)	2 GB – 64 GB	4 GB - 32 GB
Data - instruction (L1) cache	64 KB - 64 KB per core	64 KB - 64 KB per core
Level 2 (L2) cache	4 MB <sup>b</sup>	4 MB <sup>b</sup>
Level 3 (L3) cache	-	-
<b>Reliability, availability, serviceability</b>		
Chipkill memory	X	X
Service processor	X	X
Integrated management processor	X	X
Dynamic Processor Deallocation	X	X
Processor Instruction Retry	X	X
Alternate Processor Recovery	-	-
Redundant hot-plug power	Optional (at chassis level)	Optional (at chassis level)
Redundant hot-plug cooling	Optional (at chassis level)	Optional (at chassis level)
LED diagnostics	X	X
EnergyScale™ <sup>p</sup>	X	X
<b>Capacity and expandability</b>		
Capacity on Demand (CoD) functions	-	-
PowerVM™ Express Edition	-	-
PowerVM Standard Edition	X <sup>w</sup>	X <sup>w</sup>
PowerVM Enterprise Edition	Optional	Optional
Maximum logical partitions/micro-partitions	20	40
Available expansion slots	2	2
Maximum PCI-X bus speed (MHz)	133	133
Maximum disk bays	2	1
Minimum   maximum internal disk storage	73 GB <sup>v</sup>   292 GB	73 GB <sup>v</sup>   146 GB
Storage interface	Serial Attached SCSI	Serial Attached SCSI
RAID support for disk on blade	X	-
<b>Connectivity<sup>n</sup></b>		
Daughter Cards (CFFv or CFFh)	Optional	Optional
2/4 Port Ethernet Expansion Card (CFFh)	X	X
Dual Gigabit Ethernet	X	X
4 Gigabit Fibre Channel	Optional (QLogic: Linux® or AIX®, Emulex: Linux or AIX)	Optional (QLogic: Linux or AIX, Emulex: Linux or AIX)
4X InfiniBand®	Optional	Optional
<b>Performance*</b>		
rPerf for AIX	14.71	30.26
CPW for IBM i (number cores)	7,100 <sup>e</sup> (2)	13,800 <sup>e</sup> (4)

## Power 520 / Power 550

Product Line	IBM Power™ 520 Express	IBM Power 550 Express
Machine type	8203-E4A; 9407-M15, 9408-M25	8204-E8A; 9409-M50
System packaging	tower or 19" rack drawer (4U)	tower or 19" rack drawer (4U)
Microprocessor type	64-bit POWER6	64-bit POWER6
# of processor cores per system	1, 2 or 4 <sup>n</sup>	2, 4, 6 or 8 <sup>k</sup> (2 cores per processor card)
Clock rates available	4.2 GHz	3.5 GHz, 4.2 GHz
System memory (minimum - maximum)	1 -16 GB (1 core), 1-32 GB (2-core) 1- 64 GB (4 core)	3.5 GHz: 1 – 128 GB; 4.2 GHz: 1 GB - 256 GB (12 DIMM slots per processor card)
Data - instruction (L1) cache	64 KB - 64 KB per core	64 KB - 64 KB per core
Level 2 (L2) cache	4 MB per core	8 MB per dual core processor chip
Level 3 (L3) cache	-	32 MB per dual core processor chip
<b>Reliability, availability, serviceability</b>		
Chipkill memory	X	X
Service processor	X	X
Hot-swappable disks	X	X
Dynamic Processor Deallocation	X (except 1-core system)	X
Processor Instruction Retry	X	X
Alternate Processor Recovery	X	X
Dynamic deallocation: PCI bus slots	X	X
Hot-plug slots	X	X
Blind-swap slots in CEC	-	-
Redundant hot-plug power	Optional	Optional
Redundant hot-plug cooling	X	X
EnergyScale <sup>p</sup>	X	X
<b>Capacity and expandability</b>		
Capacity on Demand (CoD) functions	N/A (except 9408-M25 has P)	N/A (except 9409-M50 has P)
PowerVM Express Edition	Optional	Optional
PowerVM Standard Edition	Optional	Optional
PowerVM Enterprise Edition	Optional	Optional
Maximum logical partitions/micro-partitions	40	80
Maximum CEC PCI slots	2 PCI-X DDR (64-bit) + 3 PCIe 8x	2 PCI-X DDR (64-bit) + 3 PCIe 8x
Max PCI slots: CEC + 12X I/O drawers	50 PCI-X DDR (64-bit) + 2 PCIe 8x	50 PCI-X DDR (64-bit), 1 PCIe 8x
Max PCI slots: CEC + RIO I/O drawers	2 PCI-X DDR + 2 PCIe + (84 PCI-X if AIX or 168 PCI-X if IBM i)	2 PCI-X DDR + 1 PCIe + (84 PCI-X if AIX or 168 PCI-X if IBM i)
Maximum PCI-X bus speed (MHz)	266	266
CEC Disk   CEC media bays	6   2	6   2
Maximum disk storage in CEC	2.7 TB	2.7 TB
Minimum   Maximum I/O loops (12X and/or RIO)	1-core: 0   0, 2-core: 0   1, 4-core: 0   2	2-core: 0   1, 4-,6-,8-core: 0   2
Minimum   maximum RIO I/O drawers	0   12 (max 6 drawers per loop)	0   12 (max 6 drawers per loop)
Minimum   maximum 12X I/O drawers	0   8 (max 4 drawers per loop)	0   8 (max 4 drawers per loop)
Maximum disk drives (CEC+I/O drawers)   Storage with i formatted drives	294   125 TB with 428 GB drives	582   249 TB with 428 GB drives
Maximum disk drives (CEC+I/O drawers)   Storage with AIX/Linux formatted drives	294   132TB with 450 GB drives	582   261 TB with 450 GB drives
<b>Connectivity</b>		
Please reference the IBM Sales Manual or the I/O Facts and Features document at <a href="http://ibm.com/systems/power/hardware/factsfeatures.html">ibm.com/systems/power/hardware/factsfeatures.html</a> for more information on I/O features and adapters		
<b>Performance*</b>		
rPerf for AIX (number cores)	4.2 GHz: 8.39 (1), 15.95 (2), 31.48 (4)	3.5 GHz: 15.85 (2), 31.27 (4), 45.04 (6), 58.80 (8); 4.2 GHz: 18.38 (2), 36.28 (4), 52.24 (6), 68.20 (8)
CPW for IBM i (number cores)	4.2 GHz: 4300 (1), 8300 (2), 15600 (4)	3.5 GHz: 7750 (2), 15000 (4), 20300 (6), 27600 (8); 4.2 GHz: 9200 (2), 18,000 (4), 23850 (6), 32650 (8)

## Power 560

Product Line	IBM Power 560 Express
Machine type	8234-EMA
System packaging	19" rack drawer (4U)
Microprocessor type	64-bit POWER6
# of processor cores per system	4, 8, 16 ( 4 cores per processor card)
Clock rates available	3.6 GHz
System memory (minimum - maximum)	8 GB - 384 GB (max 96 GB per processor card)
Data - instruction (L1) cache	64 KB - 64 KB per core
Level 2 (L2) cache	8 MB - per dual core processor chip
Level 3 (L3) cache	32 MB - per dual core processor chip
<b>Reliability, availability, serviceability</b>	
Chipkill memory	X
Service processor	X (redundant optional on 16 core)
Hot-swappable disks	X
Dynamic Processor Deallocation	X
Processor Instruction Retry	X
Alternate Processor Recovery	X
Dynamic deallocation: PCI bus slots	X
Hot-plug slots	X
Blind-swap slots in CEC	X
Redundant hot-plug power	X
Redundant hot-plug cooling	X
EnergyScale <sup>P</sup>	X
<b>Capacity and expandability</b>	
Capacity on Demand (CoD) functions	-
PowerVM Express Edition	-
PowerVM Standard Edition	Optional
PowerVM Enterprise Edition	Optional
Maximum logical partitions/micro-partitions	160
Maximum CEC PCI slots	4 PCI-X DDR (64-bit); 8 PCIe 8x
Maximum PCI slots with CEC plus 12X I/O drawers	76 PCI-X DDR (64-bit); 7 PCIe 8x
Maximum PCI slots with CEC plus RIO I/O drawers	4 PCI-X DDR + 7 PCIe + (126 PCI-X if AIX)
Maximum PCI-X bus speed (MHz)	266
Maximum CEC Disk   CEC media bays	12   2
Maximum CEC disk storage	5.4 TB with 450 GB drives
Minimum   Maximum I/O loops (12X and/or RIO)	4-core: 0   1; 8-core: 0   2; 16-core: 0   3
Minimum   Maximum 12X I/O drawers	0   12 (max 4 drawers per loop)
Minimum   Maximum RIO I/O drawers	0   18 (max 6 drawers per loop)
Maximum disk drives (CEC+I/O drawer)   storage with IBM i formatted drives	1332   570 TB with 428 GB drives
Maximum disk drives (CEC+I/O drawer)   storage with AIX/Linux formatted drives	1332   599 TB with 450 GB drives
<b>Connectivity</b>	
Please reference the IBM Sales Manual or the I/O Facts and Features document at <a href="http://ibm.com/systems/power/hardware/factsfeatures.html">ibm.com/systems/power/hardware/factsfeatures.html</a> for more information on I/O features and adapters	
<b>Performance*</b>	
rPerf for AIX (number cores)	3.6 GHz: 31.3 (4), 57.3 (8), 100.3 (16)
CPW for IBM i (number cores)	3.6 GHz: 14100 (4), 27600 (8), 48500 (16)

## Power 570

Product Line	IBM Power 570 (2 cores per processor card)	IBM Power 570 (4 cores per processor card)
Machine type	9117-MMA	9117-MMA
System packaging	19" rack drawer (4U)	19" rack drawer (4U)
Microprocessor type	64-bit POWER6	64-bit POWER6
# of processor cores per system	2, 4, 8, 12, 16	4, 8, 16, 24, 32
# of cores per processor card	2	4
Clock rates available	3.5; 4.2; 4.4; 4.7; and 5.0 GHz	4.2 GHz;
System memory (minimum – maximum)	2 - 768 GB (max 96 GB per proc card)	2 - 768 GB (max 96 GB per proc card)
Data - instruction (L1) cache	64 KB - 64 KB per core	64 KB - 64 KB per core
Level 2 (L2) cache	8 MB per dual core processor chip	8 MB per dual core processor chip
Level 3 (L3) cache	32 MB <sup>d</sup> per dual core processor chip	32 MB <sup>d</sup> per dual core processor chip
<b>Reliability, availability, serviceability</b>		
Chipkill memory	X	X
Service processor	X (redundant optional 8 core or larger)	X (redundant optional 16 core or larger)
Hot-swappable disks	X	X
Dynamic Processor Deallocation	X	X
Processor Instruction Retry	X	X
Alternate Processor Recovery	X	X
Dynamic deallocation: PCI bus slots	X	X
Hot Node Add	X	X
Concurrent Repair	X	X
Hot-plug slots	X	X
Blind-swap slots in CEC	X	X
Redundant hot-plug power	X	X
Redundant hot-plug cooling	X	X
EnergyScale <sup>p</sup>	X	X
<b>Capacity and expandability<sup>n</sup></b>		
Capacity on Demand (CoD) functions	P, M <sup>m</sup> , U, T, OO <sup>m</sup>	P, M <sup>m</sup> , U, T, OO <sup>m</sup>
PowerVM Express Edition	-	-
PowerVM Standard Edition	Optional	Optional
PowerVM Enterprise Edition	Optional	Optional
Max logical partitions/micro-partitions	160	160
Maximum CEC PCI slots	8 PCI-X DDR(64-bit); 16 PCIe 8x	8 PCI-X DDR(64-bit); 16 PCIe 8x
Max PCI slots: CEC + 12X I/O drawer	200 PCI-X DDR, 12 PCIe 8x	200 PCI-X DDR, 12 PCIe 8x
Max PCI slots: CEC + RIO I/O drawers	8 PCI-X DDR + 12 PCIe + (336 PCI-X if AIX or 672 PCI-X if IBM i)	8 PCI-X DDR + 12 PCIe + (336 PCI-X if AIX or 672 PCI-X if IBM i)
Maximum PCI-X bus speed (MHz)	266	266
CEC Disk   CEC media bays	24   4	24   4
Maximum CEC disk storage	10.8 TB with 450 GB drives	10.8 TB with 450 GB drives
Min   Maxi I/O loops (12X and/or RIO)	0   8 (max 1 per processor card)	0   8 (max 1 per processor card)
Minimum   Maximum 12X I/O drawers	0   32 (max 4 drawers per loop)	0   32 (max 4 drawers per loop)
Minimum   Maximum RIO I/O drawers	0   48 (max 6 drawers per loop)	0   48 (max 6 drawers per loop)
Maximum disk drives   storage with IBM i formatted drives	1344   575 TB with 428 GB drives	1344   575 TB with 428 GB drives
Maximum disk drives   storage with I/O drawers & AIX/Linux formatted drives	1344   604 TB with 450 GB drives	1344   604 TB with 450 GB drives
<b>Connectivity</b>		
Please reference the IBM Sales Manual or the I/O Facts and Features document at <a href="http://ibm.com/systems/power/hardware/factsfeatures.html">ibm.com/systems/power/hardware/factsfeatures.html</a> for more information on I/O features and adapters		
<b>Performance*</b>		
rPerf for AIX (number cores)	<b>3.5 GHz:</b> 15.85(2), 31.69(4), 58.95(8), 83.35(12), 105.75(16); <b>4.2 GHz:</b> 18.38(2), 36.76(4), 68.38(8), 96.68(12), 122.67(16); <b>4.4 GHz:</b> 19.08 (2), 38.16(4), 70.97(8), 100.35(12), 127.32(16); <b>4.7 GHz:</b> 20.13(2), 40.26(4), 74.89(8), 105.89(12), 134.35(16); <b>5.0 GHz:</b> 21.16(2) 42.32(4), 78.71(8), 111.30(12), 141.21(16)	<b>4.2 GHz:</b> 35.50(4), 64.96(8), 113.68(16), 153.46(24), 193.25(32)
CPW for IBM i (number cores)	<b>3.5 GHz:</b> 8150(2), 16100(4), 30100(8), 43100(12), 57600(16); <b>4.2 GHz:</b> 9650(2), 19200(4), 35500(8), 50500(12), 68600(16); <b>4.4 GHz:</b> 9850(2), 19400(4), 36200(8), 51500(12), 70000(16); <b>4.7 GHz:</b> 10800(2), 21200(4), 40100(8), 55500(12) 76,900(16) <b>5.0 GHz:</b> 11000(2), 21600(4), 40300(8), 56800(12), 77600(16)	<b>4.2 GHz:</b> 16200(4), 31900(8), 56400(16), 81600(24), 104800(32)

## Power 575

Product Line	IBM Power 575
Machine type	9125-F2A
Node packaging	24" system frame (2U; water-cooled)
Microprocessor type	64-bit POWER6
# of processor cores per node	32
Maximum # nodes per 42U rack	14
Maximum # nodes per cluster	64 (higher quantity available by special bid)
Clock rates available	4.7 GHz
Node memory (minimum – maximum)	32 GB - 256 GB
Data - instruction (L1) cache	64 KB - 64 KB per core
Level 2 (L2) cache	8 MB per dual core processor chip
Level 3 (L3) cache	32 MB per dual core processor chip
Reliability, availability, serviceability	
Chipkill memory	X
Service processor	X
Hot-swappable disks	X
Dynamic Processor Deallocation	X
Processor Instruction Retry	X
Alternate Processor Recovery	X
Dynamic deallocation: PCI bus slots	X
Hot Node Add	X
Concurrent Repair	-
Hot-plug slots	X
Blind-swap slots	X
Redundant hot-plug power	X
Redundant hot-plug cooling	-
EnergyScale <sup>P</sup>	X
<b>Capacity and expandability<sup>n</sup></b>	
Capacity on Demand (CoD) functions	-
PowerVM Express Edition	-
PowerVM Standard Edition	Optional
PowerVM Enterprise Edition	Optional
Maximum logical partitions/micro-partitions	254
Maximum CEC PCI slots per node	4 PCIe
Minimum   Maximum 12X I/O loops per node	0   1
Minimum   Maximum RIO I/O loops per node	0   0
Maximum PCI slots per node with CEC plus 24" 12X I/O drawer	4 PCIe (I/O drawer's PCI slots not used)
Maximum PCI-X bus speed (MHz)	133
CEC Disk   CEC media bays per node	2 SFF SAS   -
Maximum CEC disk storage per node	292 GB with 146GB drives
Minimum   maximum 12X 24" I/O drawers per node	0   1
Maximum disk bays   storage with CEC + 24" I/O drawer & AIX/Linux formatted drives per node	18   4.8 TB with 146 GB SCSI drives
Maximum disk bays   storage with 19" disk I/O drawer & AIX/Linux formatted drives	12   5.4 TB with 450 GB SAS drives per disk drawer
<b>Connectivity</b>	
Please reference the IBM Sales Manual or the I/O Facts and Features document at <a href="http://ibm.com/systems/power/hardware/factsfeatures.html">ibm.com/systems/power/hardware/factsfeatures.html</a> for more information on I/O features and adapters	
<b>Performance*</b>	
rPerf for AIX	Not applicable
CPW for IBM i	IBM i not supported on 575

## Power 595

Product Line	IBM Power 595
Machine type	9119-FHA
System packaging	24" system frame (+expansion frames)
Microprocessor type	64-bit POWER6
# of processors cores/system	8 - 64 (4.2 GHz), 16 – 64 (5.0 GHz)
# of cores per processor book	8
Clock rates available	4.2 GHz; 5.0 GHz
System memory (minimum - maximum)	16 GB - 4 TB (Max 32 DIMM slots per processor book)
Data - instruction (L1) cache	64 KB - 64 KB per core
Level 2 (L2) cache	8 MB per dual core processor chip
Level 3 (L3) cache	32 MB per dual core processor chip
<b>Reliability, availability, serviceability</b>	
Chipkill memory	X
Service processor	X (redundant is standard)
Hot-swappable disks in 24" drawer	X
Dynamic Processor Deallocation	X
Processor Instruction Retry	X
Alternate Processor Recovery	X
Dynamic deallocation: PCI bus slots	X
Hot Node Add	X
Concurrent Repair	X
Hot-plug slots	X
Blind-swap slots	X
Redundant hot-plug power	X
Redundant hot-plug cooling	X
EnergyScale <sup>P</sup>	X
<b>Capacity and expandability</b>	
Capacity on Demand (CoD) functions	P, M, U, T, OO,
PowerVM Express Edition	-
PowerVM Standard Edition	Optional
PowerVM Enterprise Edition	Optional
Maximum logical partitions/micro-partitions	254
Minimum   Maximum I/O loops (12X and/or RIO)	1   32 (max 4 loops per processor book)
Maximum PCI-X slots with one 24" I/O drawer	20 (14 PCI-X DDR (64-bit) + 6 PCI-X)
Maximum PCI-X slots with 30 12X 24" I/O drawers	600 (420 PCI-X DDR (64-bit) + 180 PCI-X)
Maximum PCI-X slots with 19" I/O drawers <sup>U</sup>	600 PCI-X AIX; 1336 PCI-X IBM i
Maximum PCI-X bus speed (MHz)	266
Disk   media bays (one 24" drawer)	16   -
Maximum disk storage with one 24" I/O drawer	4.8 TB with 146 GB AIX drives
Minimum I/O drawers with PCI slots	AIX/Linux: 1 24" drawer (12X or RIO); IBM i: 1 #5790 or 1 24" drawer (12X)
Maximum 24" I/O drawer	30 12X or 12 RIO
Maximum 19" I/O drawers with PCI slots	96 (IBM i only)
Max disk drives   TB with 24" I/O drawers & AIX formatted drives	480   70 TB with 146 GB drives
Max disk drives   TB with 19" I/O drawers & i formatted drives	2200   950 TB with 428 GB drives
Maximum disk drives   storage with 19" I/O drawers with AIX/Linux formatted drives	2200   999 TB with 450 GB drives
<b>Connectivity</b>	
Please reference the IBM Sales Manual or the I/O Facts and Features document at <a href="http://ibm.com/systems/power/hardware/factsfeatures.html">ibm.com/systems/power/hardware/factsfeatures.html</a> for more information on I/O features and adapters	
<b>Performance*</b>	
rPerf for AIX (number of cores)	<b>4.2 GHz:</b> 72.58(8), 142.90(16), 204.70(24), 266.51(32), 320.05(40), 373.60(48), 413.46(56), 479.89(64); <b>5.0 GHz:</b> 164.67(16), 235.90(24), 307.12(32), 368.82(40), 430.53(48), 476.46(56), 553.01(64)
CPW for IBM i (number of cores) (measurement for 64-core config done with two 32-processor partitions)	<b>4.2 GHz:</b> 35500(8), 66400(16), 93800(24), 128000(32), 256200(64); <b>5.0 GHz:</b> 41000(8), 77000(16), 108100(24), 147,900(32), 294700(64)

## System Unit Details

System Unit Details	BladeCenter JS12 Express	BladeCenter JS22 Express	Power 520 Express	Power 550 Express
Disk bays in CEC	2	1	6 SAS	6 SAS
Available media bays	- <sup>3</sup>	- <sup>3</sup>	2	2
Standard HH size	-	-	1 for tape	1 for tape
Slimline size	-	-	1 for DVD ROM/RAM	1 for DVD ROM/RAM
Standard DVD-ROM	- <sup>3</sup>	- <sup>3</sup>	-	-
System ports <sup>1</sup>	-	-	2	2
Integrated USB ports	4	4	3	3
HMC ports	-	-	2	2
Integrated Ethernet ports/controller	2/1	2/1	Max 4 1Gb or 2 10Gb ports / 1	Max 4 1Gb or 2 10 Gb ports / 1
Integrated SCSI ports/controller	-	-	-	-
Integrated SAS connectors/controller	2/1	1/1	8/1	8/1
Max SAS speed	3.0/lane, 2 lanes	3.0/lane, 1 lane	3.0/lane, 8 lanes	3.0/lane, 8 lanes
Protected write cache for integrated SAS controller	-	-	Optional 175 MB. enable RAID 5/6 & help disk performance	Optional 175 MB. enable RAID 5/6 & help disk performance
Optional more disk bays with write cache	-	-	Yes, 12 SAS with a #5886	Yes, 12 SAS with a #5886
PCI slots	2	2	5 <sup>2</sup>	5 <sup>2</sup>
Long 64-bit	1 PCIe 8x	1 PCIe 8x	1 PCIe 8x	1 PCIe 8x
Short 64-bit	-	-	2 PCIe 8x	2 PCIe 8x
Long 64-bit (MHz)	1 PCI-X (133)	1 PCI-X (133)	2 PCI-X DDR (266)	2 PCI-X DDR (266)
Short 64-bit (MHz)	-	-	-	-
RJ-4x connector	X	X	X	X
Rack light indicator	X	X	X	X
LED diagnostics	X	X	X	X

X = Available; - = Not Available

<sup>1</sup> AIX uses only for modem and async terminal connections. Not supported by AIX when HMC ports are connected to Hardware Management Console. IBM i uses for status link to UPS.

<sup>2</sup> If GX I/O loop adapter(s) for optional I/O drawers installed, one or two PCIe slots not usable .

<sup>3</sup> Available via BladeCenter chassis.

Bus Signaling Rate (Peak bandwidth)	BladeCenter JS12 Express	BladeCenter JS22 Express	Power 520 Express	Power 550 Express
Memory to processor (GB/second)	21.3	21.3	32.0	128.0
L2 to L3 cache (GB/second)	-	-	-	134.4
GX+ I/O subsystem (GB/second)	5.8	5.8	14.0	14.0

Note: L2 to L3 cache and GX+ I/O subsystem bus signaling rate (Peak bandwidth) based on fastest processor available on server and Memory to processor rate based on fastest memory speed utilized on server.

## System Unit Details (continued)

System Unit Details	Power 560	Power 570	Power 575	Power 595
Disk bays in CEC	6 SAS (4-,8-core); 12 SAS (16-core)	Max 24 SAS (6 per building block)	2	0 (16 SCSI per 24" I/O drawer)
Available media bays				
Standard size	-	-	-	Max 2 via optional #5720 media drawer
Slimline size	1 DVD (4-,8-core); 2 DVD (16-core)	Max 4 DVD (1 per building block)	-	Max 2 via #5720 opt. media drawer
System ports <sup>4</sup>	2	-	-	-
Integrated USB ports	2 (4-,8-core); 4 (16-core)	Max 8 (2 per building block)	-	16
HMC ports	2	4	2	4
Integrated 1G/10G Ethernet ports/controller	Max 8 1Gb or 4 10Gb / 2 <sup>2</sup>	Max 16 1Gb or 8 10Gb / 4 <sup>2</sup>	4/2	-
Integrated SCSI ports/controller	-	-	-	4/4 per 24" I/O drawer
Max SCSI speed	-	-	-	320 Mbps
Integrated SAS connectors/controller	5 / 1 (4-,8-core); 10/2 (16-core)	Max 20/4 (5/1 per building block)	1/2	-
Max SAS speed	3.0/lane, 8 lanes	3.0/lane, 8 lanes	-	-
Write cache for integrated SAS controller	-	-	-	-
PCI slots	6 (4-,8-core); 12 (16-core)	6/building block		20 per 24" drawer
Long 64-bit	3 PCIe 8x <sup>3</sup>	3 PCIe 8x <sup>3</sup>	4 PCIe	-
Short 64-bit	1 PCIe 8x	1 PCIe 8x	-	-
Long 64-bit (MHz)	2 PCI-X (266)	2 PCI-X DDR (266)	-	14 (266), 6 (133) per 12X drawer
RJ-4x connector	X	-	-	-
Rack light indicator	-	-	-	-
LED diagnostics	X	X	X	X

X = Available; - = Not Available

<sup>2</sup> Assuming maximum building blocks installed.

<sup>3</sup> If GX I/O loop adapters for optional I/O drawers installed, one PCIe slot not usable in that building block.

<sup>4</sup> AIX Uses only for modem and async terminal connections. Not supported on AIX when HMC ports are connected to Hardware Management Console. IBM i uses for status link to UPS.

Bus Signaling Rate (Peak bandwidth)	Power 560	Power 570	Power 575	Power 595
Memory to processor (GB/second)	128.0	256.0	273.0	1376.0
L2 to L3 cache (GB/second)	230.0	300.8	601.6	2560.0
GX+ I/O subsystem (GB/second)	24.0	66.7	94.0	640.0

Note: L2 to L3 cache and GX+ I/O subsystem bus signaling rate (Peak bandwidth) based on fastest processor available on server and Memory to processor rate based on fastest memory speed utilized on server.

## Server I/O Drawers/Towers

Drawer	Server Loop Attachment	PCI Slots per Drawer	Disk Bays per Drawer	POWER6 Availability	Max Drawers per Loop	Footprint
7311-D20	RIO-2	7 PCI-X	12 SCSI	Y	6	19" rack 4U
#0595	RIO-2 <sup>1</sup>	7 PCI-X	12 SCSI	Y	6	19" rack 5U
#5095	RIO-2 <sup>1</sup>	7 PCI-X	12 SCSI	w/d, mig	6	Tower
7314-G30	12X	6 PCI-X DDR	0	nan, mig	4	19" rack ½ 4U
#5796	12X	6 PCI-X DDR	0	Y	4	19" rack ½ 4U
7311-D11	RIO-2	6 PCI-X	0	nan, mig	4	19" rack ½ 4U
#5790	RIO-2 <sup>1</sup>	6 PCI-X	0	Y	6	19" rack ½ 4U
#5094	RIO-2 <sup>1</sup>	14 PCI-X	15/45 SCSI	nan, mig	6	Tower
#5294	RIO-2 <sup>1</sup>	28 PCI-X	90 SCSI	nan, mig	3 <sup>2</sup>	19" rack 36U
#5096	RIO-2 <sup>1</sup>	14 PCI-X	0	Y	6	Tower
#5296	RIO-2 <sup>1</sup>	28 PCI-X	0	Y	3 <sup>2</sup>	19" rack 36U
#0588	RIO-2 <sup>1</sup>	14 PCI-X	0	w/d, mig	6	19" rack 8U
#5088	RIO-2 <sup>1</sup>	14 PC-X	0	w/d, mig	3 <sup>5</sup>	tower
EXP24 7031-D24	n/a	0	24 SCSI	nan, mig	n/a	19" rack 4U
EXP24 #5786	n/a	0	24 SCSI	Y	n/a	19" rack 4U
EXP 12S #5886	n/a	0	12 SAS	Y	n/a	19" rack 2U
7040-61D	RIO-2	20 PCI-X	16 SCSI	w/d, mig	1 <sup>4</sup>	24" rack
#5791	RIO-2	20 PCI-X	16 SCSI	Y	1 <sup>4</sup>	24" rack
#5794	RIO-2	20 PCI-X	8 SCSI	nan, mig	1 <sup>4</sup>	24" rack
#5797 <sup>3</sup>	12X	14 PCI-X DDR, 6 PCI-X	16 SCSI	Y	1 <sup>4</sup>	24" rack
#5798 <sup>3</sup>	12X	14 PCI-X DDR, 6 PCI-X	16 SCSI	Y	1 <sup>4</sup>	24" rack

<sup>1</sup> System i servers used the term "HSL" instead of "RIO". The terms are interchangeable.

<sup>2</sup> Requires two positions on the loop. Physically is two I/O towers in a 19" 36U rack

<sup>3</sup> #5797 and #5798 same drawer except #5797 supports longer 12X cables and can be located in an expansion rack. #5798 can not be in expansion rack, only the CEC frame.

<sup>4</sup> Logically two drawers in one 4-U foot print. Can be configured with two loops per drawer or one loop per drawer

<sup>5</sup> 5088 bolted to top of 5094 tower. Thus combination of 5094 + 5088 require 2 positions on loop

w/d Withdrawn from marketing, not orderable from IBM Manufacturing

nan Not Available New – can't/shouldn't be ordered with a Power System. Use either equivalent feature code I/O drawer or use newer technology drawer (12X or SAS)

mig Migrate Attachment of existing I/O units supported

Y New I/O drawers orderable from IBM Manufacturing

n/a Not applicable

## Server I/O Drawer Attachment

(inclusion in list does not necessarily mean can order new drawers)

Server Drawer	520 1-core (0 Loops)	520 2-,4-core (0-2 Loops)	550 0-2 Loops	560 (0-3 Loops)	570 0-8 Loops	575 0 Loops	595 <sup>1</sup> 1-32 Loops
Max <sup>2</sup> all RIO	0	12	12	18	48	0	96 (IBM i), 12 (AIX)
Max <sup>2</sup> all 12X	0	8	8	12	32	1	30
7311-D20	0	Max 12	Max 12	Max 18	Max 48	0	0
#0595	0	Max 12	Max 12	0	Max 48	0	Max 95
#5095	0	Max 6	Max 12	0	0	0	0
7314-G30	0	Max 8	Max 8	Max 12	Max 32	0	0
#5796	0	Max 8	Max 8	Max 12	Max 32	0	0
7311-D11	0	0	0	0	Max 20	0	0
#5790	0	Max 12	Max 12	0	Max 48	0	Max 96
#5094	0	Max 12	Max 12	0	Max 48	0	Max 95
#5294	0	Max 6	Max 6	0	Max 24	0	Max 47
#5096	0	Max 12	Max 12	0	Max 48	0	Max 95
#5296	0	Max 6	Max 6	0	Max 24	0	Max 47
#0588	0	Max 12	Max 12	0	Max 48	0	Max 95
#5088	0	Max 6	Max 6	0	Max 48	0	0
EXP24	0	Max 12	Max 24	Max 26	Max 60	0	0
7031-D24							
EXP24 #5786	0	Max 12	Max 24	Max 26	Max 60	0	Max 110
EXP 12S	0	Max 24	Max 48	Max 110	Max 110	Support, limit not defined	Max 185
#5886							
7040-61D	0	0	0	0	0	0	12
#5791	0	0	0	0	0	0	12
#5794	0	0	0	0	0	0	12
#5797	0	0	0	0	0	Max 1	30
#5798	0	0	0	0	0	1 per 9125	30

<sup>1</sup> At least one I/O drawer with PCI slots is required. After Nov 21, 2008 the 12X #5797/5798 is highly recommended for that initial drawer. Prior to Nov 2008, at least one #5791 (AIX/Linux) or #5790 (IBM i) is required

<sup>2</sup> Though you can mix RIO and 12X I/O drawers on systems with two or more loops, within a loop it must be all RIO drawers or all 12X drawers. Thus if you add 12X loops, you lower the maximum number of RIO drawers, and vice versa. Note this maximum does not include I/O drawers with no PCI slots such as disk-only drawers or removable media drawers.

## For Additional I/O and I/O Adapter Information

Please reference the sales manual and the Power Systems I/O Facts and Features document  
[ibm.com/systems/power/hardware/factsfeatures.html](http://ibm.com/systems/power/hardware/factsfeatures.html)

## Physical Planning Characteristics

Note: More comprehensive information on BladeCenter chassis and blades may be found [ftp://ftp.software.ibm.com/systems/support/system\\_x/dw1fr\\_planning\\_guide\\_v4.pdf](ftp://ftp.software.ibm.com/systems/support/system_x/dw1fr_planning_guide_v4.pdf). Plus additional summary information can be found in the IBM Sales Manual at [ibm.com/common/ssj](http://ibm.com/common/ssj).

Server	BladeCenter JS12 Express	BladeCenter JS22 Express	BladeCenter S Chassis	BladeCenter H Chassis	BladeCenter HT Chassis
Machine type (AC model)	7998-60X	7998-61X	8886-EPY	7989-BCH	8750-1RX
Machine type (DC model)	-	-	-	-	8740-1RX
Packaging	Chassis mount	Chassis mount	19" rack blade cabinet (7U)	19" rack blade cabinet (9U)	19" rack blade cabinet (12U)
Number processor cores/blades	2	4	Up to 6 blades	Up to 14 blades	Up to 12 blades
Maximum KVA	-	-	3.5	8.0	7.8
Maximum watts	-	-	3500	8000	7773
Maximum BTU/hour	-	-	11942	27280	26552
Voltage (AC)	-	-	110 - 127; 200 - 240	200 - 240	200 - 240
Voltage (DC)	-	-	-	-	-48 - -60**
Power supply	-	-	N+1 standard	N+N standard	N+N standard
Height					
inches	9.65	9.65	7U - 12.0	9U - 15.75	12U - 21.0
millimeters	245	245	306	400	528
Width					
inches	1.14	1.14	17.5	17.5	17.4
millimeters	29	29	444	444	441
Depth					
inches	17.55	17.55	28.9	28.0	27.8
millimeters	445	445	733	711	706
Maximum altitude					
feet	7000	7000	7000	7000	6000
meters	2133	2133	2133	2133	1800

\*\* NEBS environment

## Physical Planning Characteristics (continued)

Note: More Power 520, 550, 560, 570, 575, 595 comprehensive information may be found in the IBM Site and Hardware Planning document) at <http://publib.boulder.ibm.com/infocenter/systems/scope/hw>. Plus, additional summary information can be found in the IBM Sales Manual for each server at [ibm.com/common/ssj](http://ibm.com/common/ssj)

Server	Power 520 Express	Power 550 Express	Power 560 Express
Packaging	19" rack drawer (4U) or Tower	19" rack drawer (4U) or Tower	19" rack drawer (4U)* or Tower
Voltage (AC)	100 - 127, 200 - 240 1-phase	100 - 127, 200 - 240 1-phase	100 - 127, 200 - 240 1-phase
Power supply	N +1 optional	N +1 optional	N +1 optional
Maximum altitude			
feet	10000	10000	10000 **
meters	3048	3048	3048 **

Server	Power 570	Power 570 (4 core processor card #7540)	Power 575	Power 595
Packaging	19" rack drawer (4U)*	19" rack drawer (4U)*	24" system frame (2U; water-cooled)	24" system frame (+expansion frames)
Voltage (AC)	200 - 240 1-phase	200 - 240 1-phase	200 - 240, 380 - 415, 480 3-phase	200 - 240, 380 - 415, 480 3-phase
Power supply	N+1 standard	N+1 standard	N+1 standard	N+1 standard
Internal Battery Backup for 24" rack (CEC & expansion)	-	-	optional	optional
Maximum altitude				
feet	10000	10000**	10000	10000
meters	3048	3048**	3048	3048

\* Figures are for a single building block

\*\* For system configurations installing above 2400 meters, additional ambient room temperature limits are in effect. Please refer to the Site and Hardware Planning Guide for details.

I/O Drawer	7311-D11 or #5790	7311-D20 or #0595	7314-G30 or #5796
	RIO attach, 6 PCI slots	RIO attach, 7 PCI slots & 12 disk slots	12X attach, 6 PCI slots
Packaging	19" rack drawer	19" rack drawer	19" rack drawer
Rack space	2 units in 4U space	4U for 7311, 5U for #0595	2 units in 4U space
Power supply	N+1 standard	N+1 optional	N+1 standard
Maximum altitude			
feet	10000	10000	10000
meters	3048	3048	3048

Racks	7014-S11 or #0554	7014-S25 or #0555	7014-T00 or #0551	7014-T42 or #0553	7014-B42
	11U	25U	36U	42U	42U
Height					
inches	24.0	49.0	71.0 - 75.8	79.3	79.3
millimeters	612	1344	1804 - 1926	2015	2015
Width (can vary depending on use of side panels)					
inches	20.5	23.8	24.5 - 25.4	24.5 - 25.4	24.5 - 25.4
millimeters	520	605	623 - 644	623 - 644	623 - 644
Depth (can vary depending on door options selected)					
inches	34.4	39.4	41.0 - 45.2	41.0 - 45.2	41.0 - 55.5
millimeters	874	1001	1042 - 1098	1043 - 1098	1042 - 1409

## Warranty

Standard Service Warranty <sup>1,4</sup>	BladeCenter JS12 Express	BladeCenter JS22 Express	Power 520 Express	Power 550 Express	Power 560	Power 570	Power 575	Power 595
24x7 with two hour service objective <sup>2</sup>	Optional	Optional	Optional	Optional	Optional	Optional	Optional	-
24x7 with four hour service objective	-	Optional	Optional	Optional	Optional	Optional	Optional	-
24x7 with same-day service objective	-	-	-	-	-	-	-	Standard <sup>3</sup>
9x5 same-business-day with four hour service objective	-	Optional	Optional	Optional	Optional	Optional	-	Optional
9x5 next-business-day with four hour service objective	Optional	-	-	-	-	-	Optional	-
9x5 next-business-day	Standard <sup>3</sup>	Standard <sup>3</sup>	Standard <sup>3</sup>	Standard <sup>3</sup>	Standard <sup>3</sup>	Standard <sup>3</sup>	Standard <sup>3</sup>	-

<sup>1</sup> These warranty terms and conditions are for the United States and may be different in other countries. Consult your local IBM representative or IBM Business Partner for country-specific information.

<sup>2</sup> Available in selected cities.

<sup>3</sup> Customer Replaceable Unit (CRU) service.

<sup>4</sup> All systems have a 1-year warranty except the BladeCenter JS12 Express and JS22 Express which have a 3-year warranty.

## Power Systems Operating Systems Support

Power™ Systems Software	BladeCenter JS12 Express	BladeCenter JS22 Express	Power 520 Express	Power 550 Express	Power 560 Express	Power 570	Power 575	Power 595
AIX Group	C5	C5	D5	E5	E5	F5	F5	H5
IBM i Tier/Group	P05	P10	P05/P10	P20	P20	P30	-	P50
<b>Operating system releases supported</b>								
AIX V5.3 (5765-G03)**	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
AIX V6.1 (5765-G62)**	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
IBM i 5.4	-	-	Supported	Supported	-	Supported	-	Supported
IBM i 6.1	Supported	Supported	Supported	Supported	Supported	Supported	-	Supported
Red Hat Enterprise Linux (RHEL) for POWER™ V4 (5639-RHL)**	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
RHEL for POWER V5**	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
SLES 10 for POWER**	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
PowerHA™ for AIX V5.4 (5765-F62)	-	Supported	Supported	Supported	Supported	Supported	-	Supported
PowerHA for Linux V5.4 (5765-G71)	-	Supported	Supported	Supported	Supported	Supported	-	-
PowerHA for i V6.1 (5761-HAS)	Supported	Supported	Supported	Supported	Supported	Supported	-	Supported
CSM for AIX 5L V1.7 (5765-F67)	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
CSM for Linux on POWER V1.7 (5765-G16)	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
CSM for Linux Multiplatform V1.7 (5765-E88)	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported

\*\* Consult your local IBM representative or IBM Business Partner for release levels supported.

## Performance Notes

The performance information contained herein is current as of the date of this document. 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.

rPerf (Relative Performance) is an estimate of commercial processing performance relative to other IBM UNIX® systems. It is derived from an IBM analytical model which uses characteristics from IBM internal workloads, TPC and SPEC benchmarks. The rPerf model is not intended to represent any specific public benchmark results and should not be reasonably used in that way. The model simulates some of the system operations such as CPU, cache and memory. However, the model does not simulate disk or network I/O operations.

rPerf estimates are calculated based on systems with the latest levels of AIX and other pertinent software at the time of system announcement. Actual performance will vary based on application and configuration specifics. The IBM eServer™ pSeries® 640 is the baseline reference system and has a value of 1.0. Although rPerf may be used to approximate relative IBM UNIX commercial processing performance, actual system performance may vary and is dependent upon many factors including system hardware configuration and software design and configuration. Note that the rPerf methodology used for the POWER6 processor-based systems is identical to that used for the POWER5 processor-based systems. Variations in incremental system performance may be observed in commercial workloads due to changes in the underlying system architecture. For additional information about rPerf, contact your local IBM office or IBM authorized reseller.

Commercial Processing Workload (CPW) is a relative measure of performance of systems running the IBM i operating system. Performance in client environments may vary. The value is based on maximum configurations. Please refer to the “IBM Power Systems Performance Capabilities Reference—IBM i operating system Version 6.1” at the following Web site for a complete description of CPW and the CPW rating for IBM Power Systems. ([ibm.com/systems/i/advantages/perfmgmt/pdf.pcrm.pdf](http://ibm.com/systems/i/advantages/perfmgmt/pdf.pcrm.pdf) )

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SPEC – <http://www.spec.org>

TPC – <http://www.tpc.org>

## More information

- Contact your IBM marketing representative or IBM Business Partner
- Access the Power Systems Products and Services page on IBM's World Wide Web server at [ibm.com/systems/power](http://ibm.com/systems/power) and then select the appropriate hardware or software option
- Product announcement letters and Sales Manual containing more details on hardware and software offerings are available at [ibm.com/common/ssj](http://ibm.com/common/ssj)
- More detailed benchmark and performance information is available at [ibm.com/systems/p/hardware/benchmarks](http://ibm.com/systems/p/hardware/benchmarks) , [ibm.com/systems/p/hardware/system\\_perf.html](http://ibm.com/systems/p/hardware/system_perf.html) and at [ibm.com/systems/i/solutions/perfmgmt/resource.html](http://ibm.com/systems/i/solutions/perfmgmt/resource.html) .
- Details on storage interface and communications/connectivity adapter support may be found in the Power Systems I/O Features Reports at [ibm.com/systems/p/hardware/factsfeatures.html](http://ibm.com/systems/p/hardware/factsfeatures.html)



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This brochure provides detailed technical specifications of all IBM POWER6 processor-based Power Systems servers and BladeCenter blades in a tabular, easy-to-scan format for easy comparison between systems. These systems are UNIX (AIX), IBM i and Linux operating system servers.

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