



IBM Power Systems Performance Report

POWER9, POWER8 and POWER7 Results

Feb 27, 2018

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Performance of IBM UNIX, IBM i and Linux Operating System Servers
February, 2018

This document contains performance and benchmark results for IBM servers and running the UNIX® (AIX®), IBM i and Linux® operating systems. This includes the IBM Power™ Systems servers and IBM PowerLinux servers.

This document contains performance results for systems based on the POWER processor through February, 2018. The historical IBM Systems Performance Report (up to February 14, 2017) are archived.

Section One includes the SPEC CPU2006 results. Section 2 is multiuser performance. The rPerf, and CPW results are presented in this section. Capacity Upgrade on Demand relative performance guidelines are presented in Sections 2b and 2c. CPW results of IBM Power Systems servers running the IBM i operating system are in Sections 2d and 2e.

Section 3 includes Java Benchmark results. Section 4 includes published SAP application benchmark results. Section 5 includes Oracle eBS published benchmark results. Section 6 includes published AIX Siebel Benchmark results

All performance measurements for the IBM Power™ Systems and IBM PowerLinux. IBM BladeCenter blades were made with systems running the AIX operating system unless otherwise indicated to have used Linux.

Footnotes used in following tables:

* - Submitted to SPEC, waiting review; (a)

Section 1 – AIX Multiuser SPEC CPU2006 Performance

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Processor / # Cores	GHz	Cache L1 (KB)	Cache L2/L3/L4 (MB)	SPECint_ rate_ 2006	SPECint_ rate_ base 2006	SPECfp_ rate_ 2006	SPECfp_ rate_ base 2006
PS702	P7/16	3.00	32/32	4/64	520	456	434	417
PS704	P7/32	2.40	32/32	8/128	--	--	778	710
PFlex260	P7+/16	4.11	32/32	4/160	856	607	586	480
PFlex460	P7+/32	4.11	32/32	8/320	1,720	1,230	1,150	946
710	P7/6	3.70	32/32	1.5/24	239	210	213	198
710	P7/8	3.55	32/32	2/32	289	255	248	229
730	P7/12	3.70	32/32	3/48	476	418	423	395
730	P7/16	3.55	32/32	4/64	575	507	482	448
730	P7+/16	4.20	32/32	4/160	874	615	591	483
740	P7/16	3.55	32/32	4/64	577	510	481	450
740	P7+/16	4.20	32/32	4/160	884	626	602	491
S814	P8/4	3.00	32/64	2/32/128	261	199	214	191
S824	P8/24	3.50	32/64	12/192/256	1,750	1,280	1,370	1,180
750	P7/32	3.30	32/32	8/128	1010	911	825	750
750	P7/32	3.55	32/32	8/128	1060	949	851	776
750	P7/32	3.60	32/32	8/128	1,150	1,010	985	909
750	P7+/32	3.50	32/32	8/320	1,600	1,150	1,130	946
750	P7+/32	4.00	32/32	8/320	1740	1230	1,200	995
E850	p8/32	3.72	32/64	16/256/512	2240	1780	--	--
755	P7/32	3.30	32/32	8/128	1010	911	825	750
755	P7/32	3.60	32/32	8/128	1,150	1,010	985	909
760	P7+/48	3.40	32/32	12/480	2,170	1,480	1,400	1,130
770	P7/48	3.50	32/32	12/192	1,930	1,740	1,760	1,560
770	P7/64	3.10	32/32	16/256	2,140	1,930	1,900	1,710
770	P7+/48	4.22	32/32	12/480	2,800	2,170	2,280	2,000
E870	p8/80	4.19	32/64	40/640/1024	6,320	4,830	5,130	4,500
780	P7/16	3.86	32/32	4/64	652	586	586	531
780	P7/64	3.86	32/32	16/256	2,530	2,300	2,240	2,030
780	P7/64	3.92	32/32	16/256	2,770	2,420	2,640	2,410
780	P7/32	4.14	32/32	16/256	1,460	1,300	1,300	1,190
780	P7/96	3.44	32/32	24/384	3,520	3,070	3,150	2,840
780	P7+/64	4.42	32/32	16/640	3,730	2,830	2,880	2,500
780	P7+/128	3.72	32/32	32/1280	6,100	4,390	4,160	3,420
E880	p8/64	4.35	32/64	32/512/1024	5,400	4,130	4,470	3,960
E880	p8/192	4.00	32/64	96/1536/2048	14,400	11,100	11,400	9,790
795	P7/32	4.00	32/32	8/128	1,440	1,270	--	--
795	P7/256	4.00	32/32	64/1024	11,200	9,880	10,500	9730

Section 1a – Linux Multiuser SPEC CPU2006 Performance

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Processor/ # Cores	GHz	L1 Cache (KB)	L2/L3/L4 Cache (MB)	SPEC		SPEC		Linux Version
					int_ rate_ 2006	int_ rate_ base 2006	fp_ rate_ 2006	fp_ rate_ base 2006	
PS702	P7/16	3.0	32/32	4/64	505	452	415	366	SLES 11 SP1
PS702	P7/16	3.0	32/32	4/64	521	466	455	405	RHEL 6
PS704	P7/32	2.46	32/32	8/128	-	-	772	687	RHEL 6
PS702	P7/16	3.00	32/32	4/64	505	452	415	366	SLES 11 SP1
PS702	P7/16	3.00	32/32	4/64	521	466	455	405	RHEL 6
PS704	P7/32	2.46	32/32	8/128	-	-	772	687	RHEL 6
PFlex260	P7+/16	4.10	32/32	4/160	825	599	562	497	SLES 11 SP2
PFlex260	P7+/16	4.10	32/32	4/160	563	563	-	-	SLES 11 SP2 using GCC
PFlex270	P7+/24	3.41	32/32	6/240	1,070	742	--	--	RHEL 6.4
PFlex270	P7+/24	3.41	32/32	6/240	696	696	--	--	RHEL 6.4 using GCC
730	P7/12	3.70	32/32	3/48	480	425	422	380	RHEL 6
730	P7/12	3.70	32/32	3/48	388	388	-	-	RHEL 6.1 using GCC
730	P7/16	3.55	32/32	4/64	578	515	477	439	SLES 11 SP1
730	P7+/16	4.20	32/32	4/160	852	618	575	509	SLES 11 SP2
730	P7+/16	4.20	32/32	4/160	582	582	-	-	SLES 11 SP2 using GCC
7R2	P7+/16	4.20	32/32	4/160	852	617	575	509	SLES 11 SP2
7R2	P7+/16	4.20	32/32	4/160	582	582	-	-	SLES 11 SP2 using GCC
740	P7/16	3.55	32/32	4/64	580	516	492	447	SLES 11 SP1
740	P7/16	3.55	32/32	4/64	581	518	497	443	RHEL 6
740	P7+/16	4.20	32/32	4/160	869	629	586	521	SLES 11 SP2
740	P7+/16	4.20	32/32	4/160	589	589	-	-	SLES 11 SP2 using GCC
S812LC	P8/10	2.92	32/64	5/80/32	642	482	468	394	RHEL 7.1
S822LC	P8/20	2.92	32/64	10/160/64	1,100	853	888	745	Ubuntu 14.04
S824	P8/24	3.52	32/64	12/192/256	1,720	1,310	1,330	1,130	RHEL 7.0
750	P7/32	3.30	32/32	8/128	1,030	924	839	736	SLES 11
750	P7/32	3.55	32/32	8/128	1,070	960	865	761	SLES 11
750	P7/32	3.55	32/32	8/128	1,140	1,020	978	873	RHEL 6
750	P7+/32	4.00	32/32	8/320	1,710	1,230	1,170	1,050	SLES 11 SP2
750	P7+/32	4.00	32/32	8/320	1,190	1,190	-	-	SLES 11 SP2 using GCC
7R4	P7+/32	4.00	32/32	8/320	1,710	1,240	1,160	1,040	RHEL 6.4
7R4	P7+/32	4.00	32/32	8/320	1,170	1,170	1,110	983	RHEL 6.4 using GCC
E850C	P8/32	4.22	32/64	16/256/512	2,520	1,990	2,090	1,830	RHEL 7.2
755	P7/32	3.30	32/32	8/128	1,030	924	839	736	SLES 11
760	P7+/48	3.40	32/32	12/480	2,130	1,480	1,360	1,190	SLES 11 SP2
760	P7+/48	3.40	32/32	12/480	1,390	1,390	-	-	SLES 11 SP2 using GCC
780	P7/32	4.14	32/32	8/256	1,470	1,310	1,310	1,160	SLES 11
780	P7/64	3.86	32/32	16/256	2,610	2,340	2,300	2,010	SLES 11
780	P7/64	3.86	32/32	16/256	2,740	2,440	2,550	2,280	RHEL 6
780	P7/96	3.44	32/32	24/384	3,560	3,140	3,080	2,850	SLES 11 SP1
780	P7+/128	3.72	32/32	32/1280	6,130	4,460	4,180	3,690	RHEL 6.3
780	P7+/128	3.72	32/32	32/1280	4,140	4,140	-	-	RHEL 6.3
E880	p8/64	4.35	32/64	32/512/1024	5,250	4,170	4,420	3,940	RHEL 7.0
795	P7/256	4.00	32/32	64/1024	10,900	9,410	10,400	9,370	SLES 11 SP1
795	P7/256	4.00	32/32	64/1024	11,300	9,930	10,500	9,640	RHEL 6

Section 2 – AIX Multiuser Performance (rPerf : POWER8 and up)

All POWER8 and POWER9 results in this table reflect performance with firmware and Operating System updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017-5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Processor / # Cores	Freq. GHz*	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
S812	P8/4	3.00	32/64	2/32/128		31.3	45.3	58.9	63.0
S822	P8/4	3.00	32/64	2/32/128		31.3	45.3	58.9	63.0
S822	P8/6	3.80	32/64	3/48/128		56.4	81.9	106.4	113.8
S822	P8/8	4.15	32/64	4/64/128		77.5	112.4	146.1	NA
S822	P8/10	3.4	32/64	5/80/128		83.1	120.4	156.6	167.5
S822	P8/8	3.00	32/64	4/64/128		60.9	88.4	114.8	122.9
S822	P8/12	3.8	32/64	6/96/256		110.0	159.6	207.4	221.9
S822	P8/16	4.15	32/64	8/128/256		151.1	219.2	284.9	NA
S822	P8/20	3.4	32/64	10/160/256		161.9	234.8	305.2	326.6
S922	p9/4	2.8 to 3.8	64/64	2/40/-		30.4	51.6	71.2	89.8
S922	p9/8	3.4 to 3.9	64/64	4/80/-		68.4	116.3	160.5	202.3
S922	p9/16	3.4 to 3.9	64/64	8/160/-		133.4	226.9	313.1	394.5
S922	p9/10	2.9 to 3.8	64/64	5/100/-		74.0	125.7	173.5	218.6
S922	p9/20	2.9 to 3.8	64/64	10/200/-		144.2	245.2	338.4	426.4
S814	P8/4	3	32/64	2/32/128		31.3	45.3	58.9	63.0
S814	P8/6	3	32/64	3/48/128		45.5	66.0	85.8	91.8
S814	P8/8	3.7	32/64	4/64/128		67.3	97.5	126.7	135.6
S914	p9/4	2.3 to 3.8	64/64	2/40/-		25.8	43.8	60.4	76.1
S914	p9/6	2.3 to 3.8	64/64	3/60/-		37.7	64.1	88.5	111.5
S914	p9/8	2.8 to 3.8	64/64	4/800/-		58.2	98.9	136.5	172.0
S824	P8/6	3.8	32/64	3/48/128		56.4	81.9	106.4	113.8
S824	P8/8	4.1	32/64	4/64/128		77.5	112.4	146.1	156.4
S824	P8/12	3.8	32/64	6/96/256		110.0	159.6	207.4	221.9
S824	P8/16	4.1	32/64	8/128/256		151.1	219.2	284.9	304.8
S824	P8/24	3.5	32/64	12/192/256		197.0	285.6	371.3	397.3
S924	p9/8	3.8 to 4.0	64/64	4/80/-		74.2	126.2	174.1	219.4
S924	p9/16	3.8 to 4.0	64/64	8/160/-		144.7	246.0	339.5	427.8
S924	p9/10	3.5 to 3.9	64/64	5/100/-		86.6	147.3	203.3	256.1
S924	p9/20	3.5 to 3.9	64/64	10/200/-		169.0	287.2	396.4	499.5
S924	p9/24	3.4 to 3.9	64/64	12/240/-		197.2	335.3	462.7	583.1
E850	p8/16	3.72	32/64	8/128/256		142.2	206.2	268.1	286.8
E850	p8/24	3.72	32/64	12/192/384		209.8	304.2	395.5	423.1
E850	p8/32	3.72	32/64	16/256/512		277.3	402.1	522.8	559.4
E850	p8/20	3.35	32/64	10/160/256		162.4	235.6	306.2	327.6
E850	p8/30	3.35	32/64	15/240/384		239.6	347.4	451.7	483.2
E850	p8/40	3.35	32/64	20/320/512		316.8	459.3	597.1	639.0
E850	p8/24	3.02	32/64	12/192/256		178.9	259.4	337.2	360.8
E850	p8/36	3.02	32/64	18/288/384		263.9	382.6	497.4	532.2
E850	p8/48	3.02	32/64	24/384/512		348.8	505.9	657.6	703.6
E850C	p8/16	4.22	32/64	8/128/256		156.3	226.6	294.7	315.3
E850C	p8/24	4.22	32/64	12/192/384		230.6	334.3	434.6	465.1
E850C	p8/32	4.22	32/64	16/256/512		304.8	442.0	574.6	614.8
E850C	p8/20	3.95	32/64	10/160/256		183.6	266.2	346.1	370.3
E850C	p8/30	3.95	32/64	15/240/384		270.8	392.6	510.5	546.2
E850C	p8/40	3.95	32/64	20/320/512		358.0	519.1	674.8	722.0
E850C	p8/24	3.65	32/64	12/192/256		205.8	298.4	388.0	415.1
E850C	p8/36	3.65	32/64	18/288/384		303.6	440.2	572.3	612.3
E850C	p8/48	3.65	32/64	24/384/512		401.4	582.0	756.5	809.5
E870	p8/32	4.02	32/64	16/256/512	32	315.0	456.8	593.8	635.4
E870	p8/64	4.02	32/64	32/512/1024	32	630.0	913.6	1,187.7	1,270.8
E870	p8/40	4.19	32/64	20/320/512	40	399.8	579.7	753.6	806.4

Model	Processor / # Cores	Freq. GHz*	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
E870	p8/80	4.19	32/64	40/640/1024	40	799.6	1,159.3	1,507.1	1,612.6
E870C	p8/32	4.02	32/64	16/256/512	32	315.0	456.8	593.8	635.4
E870C	p8/64	4.02	32/64	32/512/1024	32	630.0	913.6	1,187.7	1,270.8
E880	p8/32	4.35	32/64	16/256/512	32	334.5	485.0	630.6	674.8
E880	p8/64	4.35	32/64	32/512/1024	32	669.0	970.1	1,261.1	1,349.4
E880	p8/96	4.35	32/64	48/768/1536	32	1,003.5	1,455.2	1,891.7	2,024.2
E880	p8/128	4.35	32/64	64/1024/2048	32	1,338.1	1,940.2	2,522.3	2,698.8
E880	p8/40	4.19	32/64	20/320/512	40	399.8	579.7	753.6	806.4
E880	p8/80	4.19	32/64	40/640/1024	40	799.6	1,159.3	1,507.1	1,612.6
E880	p8/120	4.19	32/64	60/960/1536	40	1,199.4	1,739.1	2,260.8	2,419.1
E880	p8/160	4.19	32/64	80/1280/2048	40	1,599.1	2,318.8	3,014.4	3,225.4
E880	p8/48	4.00	32/64	24/384/512	48	456.0	661.3	859.7	919.8
E880	p8/96	4.00	32/64	48/768/1024	48	912.0	1,322.6	1,719.2	1,839.6
E880	p8/144	4.00	32/64	72/1152/1536	48	1,368.2	1,983.8	2,578.9	2,759.4
E880	p8/192	4.00	32/64	96/1536/2048	48	1,824.2	2,645.0	3,438.6	3,679.3
E880C	p8/32	4.35	32/64	16/256/512	32	334.5	485.0	630.6	674.8
E880C	p8/64	4.35	32/64	32/512/1024	32	669.0	970.1	1,261.1	1,349.4
E880C	p8/96	4.35	32/64	48/768/1536	32	1,003.5	1,455.2	1,891.7	2,024.2
E880C	p8/128	4.35	32/64	64/1024/2048	32	1,338.1	1,940.2	2,522.3	2,698.8
E880C	p8/40	4.19	32/64	20/320/512	40	399.8	579.7	753.6	806.4
E880C	p8/80	4.19	32/64	40/640/1024	40	799.6	1,159.3	1,507.1	1,612.6
E880C	p8/120	4.19	32/64	60/960/1536	40	1,199.4	1,739.1	2,260.8	2,419.1
E880C	p8/160	4.19	32/64	80/1280/2048	40	1,599.1	2,318.8	3,014.4	3,225.4
E880C	p8/48	4.00	32/64	24/384/512	48	456.0	661.3	859.7	919.8
E880C	p8/96	4.00	32/64	48/768/1024	48	912.0	1,322.6	1,719.2	1,839.6
E880C	p8/144	4.00	32/64	72/1152/1536	48	1,368.2	1,983.8	2,578.9	2,759.4
E880C	p8/192	4.00	32/64	96/1536/2048	48	1,824.2	2,645.0	3,438.6	3,679.3

*POWER9 frequency is expressed from Typical to max GHz

Note : upto 5% additional rPerf with Intelligent Energy Optimization enabled depending on the system

Section 2a – AIX Multiuser Performance (rPerf : POWER7)

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Processor / # Cores	Freq. GHz	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
PS700	P7/4	3.00	32/32	1/16				45.13	
PS701	P7/8	3.00	32/32	2/32				81.24	
PS702	P7/16	3.00	32/32	4/64				154.36	
PS703	P7/16	2.40	32/32	4/64				134.11	
PS704	P7/32	2.40	32/32	8/128				251.45	
PFlex260	P7/8 (2x4c)	3.30	32/32	2/32				92.80	
PFlex260	P7/16	3.22	32/32	4/64				163.80	
PFlex260	P7/16	3.55	32/32	4/64				176.60	
PFlex260	P7+/4 (2x2c)	4.08	32/32	1/40				61.20	
PFlex260	P7+/8 (2x4c)	4.08	32/32	2/80				115.50	
PFlex260	P7+/16	3.61	32/32	4/160				197.70	
PFlex260	P7+/16	4.11	32/32	4/160				218.50	
PFlex270	P7+/24	3.13	32/32	6/240				251.60	
PFlex270	P7+/24	3.41	32/32	6/240				268.00	
PFlex460	P7/16 (4x4c)	3.30	32/32	4/64				174.00	
PFlex460	P7/32	3.22	32/32	8/128				307.00	
PFlex460	P7/32	3.55	32/32	8/128				331.10	

Model	Processor / # Cores	Freq. GHz	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
PFlex460	P7+/16 (4x4c)	4.08	32/32	4/160				225.00	
PFlex460	P7+/32	3.61	32/32	8/320				372.60	
PFlex460	P7+/32	4.11	32/32	8/320				411.70	
710	P7/4	3.00	32/32	1/16				45.13	
710	P7/4	3.70	32/32	1/16				52.93	
710	P7/6	3.70	32/32	1.5/24				76.69	
710	P7/8	3.55	32/32	2/32				91.96	
710	P7+/4	3.60	32/32	1/40				53.90	
710	P7+/6	4.20	32/32	1.5/60				90.60	
710	P7+/8	4.20	32/32	2/80				115.50	
720	P7/4	3.00	32/32	1/16				45.13	
720	P7/6	3.00	32/32	1.5/24				65.52	
720	P7/8	3.00	32/32	2/32				81.24	
720	P7+/4	3.60	32/32	1/40				53.90	
720	P7+/6	3.60	32/32	1.5/60				79.50	
720	P7+/8	3.60	32/32	2/80				102.40	
730	P7/8	3.00	32/32	2/32				86.66	
730	P7/8	3.70	32/32	2/32				101.62	
730	P7/12	3.70	32/32	3/48				147.24	
730	P7/16	3.55	32/32	4/64				176.57	
730	P7+/4	4.30	32/32	1/40				61.70	
730	P7+/8	4.30	32/32	2/80				120.40	
730	P7+/6	4.20	32/32	1.5/60				90.60	
730	P7+/12	4.20	32/32	3/120				176.60	
730	P7+/8	3.60	32/32	2/80				102.40	
730	P7+/16	3.60	32/32	4/160				197.70	
730	P7+/8	4.20	32/32	2/80				115.50	
730	P7+/16	4.20	32/32	4/160				223.10	
740	P7/4	3.30	32/32	1/16				48.33	
740	P7/4	3.70	32/32	1/16				52.93	
740	P7/6	3.70	32/32	1.5/24				76.69	
740	P7/8	3.30	32/32	2/32				92.79	
740	P7/8	3.55	32/32	2/32				91.96	
740	P7/8	3.70	32/32	2/32				101.62	
740	P7/12	3.70	32/32	3/48				147.24	
740	P7/16	3.55	32/32	4/64				176.57	
740	P7+/6	4.20	32/32	1.5/60				90.60	
740	P7+/12	4.20	32/32	3/120				176.60	
740	P7+/8	3.60	32/32	2/80				102.40	
740	P7+/16	3.60	32/32	4/160				197.70	
740	P7+/8	4.20	32/32	2/80				115.50	
740	P7+/16	4.20	32/32	4/160				223.10	
750	P7/6	3.30	32/32	1.5/24				70.07	
750	P7/12	3.30	32/32	3/48				134.54	
750	P7/18	3.30	32/32	4.5/72				193.40	
750	P7/24	3.30	32/32	6/96				252.26	
750	P7/8	3.00	32/32	2/32				81.24	
750	P7/16	3.00	32/32	4/64				155.99	
750	P7/24	3.00	32/32	6/96				224.23	
750	P7/32	3.00	32/32	8/128				292.47	
750	P7/8	3.30	32/32	2/32				86.99	
750	P7/16	3.30	32/32	4/64				167.01	
750	P7/24	3.30	32/32	6/96				240.08	
750	P7/32	3.30	32/32	8/128				313.15	
750	P7/8	3.55	32/32	2/32				91.96	

Model	Processor / # Cores	Freq. GHz	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
750	P7/16	3.55	32/32	4/64				176.57	
750	P7/24	3.55	32/32	6/96				253.82	
750	P7/32	3.55	32/32	8/128				331.06	
750	P7/8	3.20	32/32	2/32				85.29	
750	P7/16	3.20	32/32	4/64				163.75	
750	P7/24	3.20	32/32	6/96				235.39	
750	P7/32	3.20	32/32	8/128				307.03	
750	P7/8	3.60	32/32	2/32				93.05	
750	P7/16	3.60	32/32	4/64				178.65	
750	P7/24	3.60	32/32	6/96				256.81	
750	P7/32	3.60	32/32	8/128				334.97	
750	P7/4	3.70	32/32	1/16				52.90	
750	P7/8	3.70	32/32	2/32				101.57	
750	P7/12(3x4c)	3.70	32/32	3/48				146.00	
750	P7/16	3.70	32/32	4/64				190.44	
750	P7/6	3.70	32/32	1.5/24				76.71	
750	P7/12(2x6c)	3.70	32/32	3/48				147.27	
750	P7/18	3.70	32/32	4.5/72				211.71	
750	P7/24	3.70	32/32	6/96				276.14	
750	P7+/8	3.50	32/32	2/80				104.50	
750	P7+/16	3.50	32/32	4/160				197.00	
750	P7+/24	3.50	32/32	6/240				275.90	
750	P7+/32	3.50	32/32	8/320				354.90	
750	P7+/8	4.00	32/32	2/80				117.10	
750	P7+/16	4.00	32/32	4/160				220.70	
750	P7+/24	4.00	32/32	6/240				309.20	
750	P7+/32	4.00	32/32	8/320				397.70	
760	P7+/12	3.10	32/32	3/120				142.10	
760	P7+/24	3.10	32/32	6/240				264.80	
760	P7+/36	3.10	32/32	9/360				370.70	
760	P7+/48	3.10	32/32	12/480				476.70	
760	P7+/12	3.40	32/32	3/120				151.40	
760	P7+/24	3.40	32/32	6/240				282.10	
760	P7+/36	3.40	32/32	9/360				395.00	
760	P7+/48	3.40	32/32	12/480				507.80	
770	P7/6	3.50	32/32	1.5/24				72.55	
770	P7/12	3.50	32/32	3/48				140.75	
770	P7/24	3.50	32/32	6/96				261.19	
770	P7/36	3.50	32/32	9/144				377.28	
770	P7/48	3.50	32/32	12/192				493.37	
770	P7/6	3.70	32/32	1.5/24				76.00	
770	P7/12	3.70	32/32	3/48				147.50	
770	P7/24	3.70	32/32	6/96				273.70	
770	P7/36	3.70	32/32	9/144				395.40	
770	P7/48	3.70	32/32	12/192				517.00	
770	P7/8	3.10	32/32	2/32				85.20	
770	P7/16	3.10	32/32	4/64				165.30	
770	P7/32	3.10	32/32	8/128				306.74	
770	P7/48	3.10	32/32	12/192				443.06	
770	P7/64	3.10	32/32	16/256				579.39	
770	P7/8	3.30	32/32	2/32				89.20	
770	P7/16	3.30	32/32	4/64				173.10	
770	P7/32	3.30	32/32	8/128				321.20	
770	P7/48	3.30	32/32	12/192				464.00	
770	P7/64	3.30	32/32	16/256				606.80	

Model	Processor / # Cores	Freq. GHz	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
770	P7+/6	4.22	32/32	1.5/60				94.50	
770	P7+/12	4.22	32/32	3/120				184.20	
770	P7+/24	4.22	32/32	6/240				345.10	
770	P7+/36	4.22	32/32	9/360				478.90	
770	P7+/48	4.22	32/32	12/480				612.70	
770	P7+/8	3.80	32/32	2/80				112.50	
770	P7+/16	3.80	32/32	4/160				219.30	
770	P7+/32	3.80	32/32	8/320				410.80	
770	P7+/48	3.80	32/32	12/480				570.10	
770	P7+/64	3.80	32/32	16/640				729.30	
780	P7/8	3.86	32/32	2/32				100.75	
780	P7/16	3.86	32/32	4/64				195.45	
780	P7/32	3.86	32/32	8/128				362.70	
780	P7/48	3.86	32/32	12/192				523.89	
780	P7/64	3.86	32/32	16/256				685.09	
780	P7/8	3.92	32/32	2/32				101.80	
780	P7/16	3.92	32/32	4/64				197.60	
780	P7/32	3.92	32/32	8/128				366.60	
780	P7/48	3.92	32/32	12/192				529.60	
780	P7/64	3.92	32/32	16/256				692.50	
780	P7/8	4.14	32/32	4/64				115.86	
780	P7/16	4.14	32/32	8/128				226.97	
780	P7/24	4.14	32/32	12/192				326.24	
780	P7/32	4.14	32/32	16/256				425.50	
780	P7/12	3.44	32/32	3/48				138.40	
780	P7/24	3.44	32/32	6/96				253.30	
780	P7/48	3.44	32/32	12/192				443.30	
780	P7/72	3.44	32/32	18/288	36			696.60	
780	P7/96	3.44	32/32	24/384	48			886.60	
780	P7+/8	4.42	32/32	2/80				126.10	
780	P7+/16	4.42	32/32	4/160				245.70	
780	P7+/32	4.42	32/32	8/320				460.30	
780	P7+/48	4.42	32/32	12/480				638.70	
780	P7+/64	4.42	32/32	16/640				817.10	
780	P7+/16	3.72	32/32	4/160				207.00	
780	P7+/32	3.72	32/32	8/320				383.90	
780	P7+/64	3.72	32/32	16/640	64			690.10	
780	P7+/96	3.72	32/32	24/960	32			1,151.60	
780	P7+/128	3.72	32/32	32/1280	64			1,380.20	
795	P7/24	3.70	32/32	6/96	24			273.51	
795	P7/48	3.70	32/32	12/192	24			547.02	
795	P7/72	3.70	32/32	18/288	24			820.53	
795	P7/96	3.70	32/32	24/384	24			1,094.04	
795	P7/120	3.70	32/32	30/480	24			1,367.55	
795	P7/144	3.70	32/32	36/576	24			1,641.06	
795	P7/168	3.70	32/32	42/672	24			1,914.57	
795	P7/192	3.70	32/32	48/768	24			2,188.08	
795	P7/32	4.00	32/32	8/128	32			372.27	
795	P7/64	4.00	32/32	16/256	32			744.54	
795	P7/96	4.00	32/32	24/384	32			1,116.81	
795	P7/128	4.00	32/32	32/512	32			1,489.08	
795	P7/160	4.00	32/32	40/640	32			1,861.35	
795	P7/192	4.00	32/32	48/768	32			2,233.62	
795	P7/224	4.00	32/32	56/896	32			2,605.89	
795	P7/256	4.00	32/32	64/1024	32			2,978.16	

Model	Processor / # Cores	Freq. GHz	Cache L1 (KB)	Cache L2/L3/L4 (MB)	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
795	P7/24	4.25	32/32	6/192	16			347.36	
795	P7/32	4.25	32/32	8/256	16			463.14	
795	P7/48	4.25	32/32	12/384	16			694.71	
795	P7/64	4.25	32/32	16/512	16			926.28	
795	P7/80	4.25	32/32	20/640	16			1,157.85	
795	P7/96	4.25	32/32	24/768	16			1,389.42	
795	P7/112	4.25	32/32	28/896	16			1,620.99	
795	P7/128	4.25	32/32	32/1024	16			1,852.56	
795	P7/64	4.25	32/32	16/512	64			777.09	
795	P7/128	4.00	32/32	32/512	64			1,406.36	
795	P7/128	4.25	32/32	32/1024	64			1,554.18	
795	P7/256	4.00	32/32	64/1024	64			2,812.72	

Note : upto 5% additional rPerf with Intelligent Energy Optimization enabled depending on the system

Section 2b – AIX POWER8 and up Capacity Upgrade on Demand Relative Performance Guidelines

All POWER8 and POWER9 results in this table reflect performance with firmware and Operating System updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017-5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
E870	p8/8	4.02	32 core	82.8	120.1	156.2	167.1
E870	p8/12	4.02		122.2	177.2	230.3	246.4
E870	p8/16	4.02		161.6	234.3	304.5	325.8
E870	p8/20	4.02		199.9	289.9	376.9	403.3
E870	p8/24	4.02		238.3	345.5	449.1	480.6
E870	p8/28	4.02		276.7	401.2	521.5	558.0
E870	p8/32	4.02		315.0	456.8	593.8	635.4
E870C	p8/8	4.02	32 core	82.8	120.1	156.2	167.1
E870C	p8/12	4.02		122.2	177.2	230.3	246.4
E870C	p8/16	4.02		161.6	234.3	304.5	325.8
E870C	p8/20	4.02		199.9	289.9	376.9	403.3
E870C	p8/24	4.02		238.3	345.5	449.1	480.6
E870C	p8/28	4.02		276.7	401.2	521.5	558.0
E870C	p8/32	4.02		315.0	456.8	593.8	635.4
E870	p8/8	4.19	40 core	85.2	123.5	160.5	171.8
E870	p8/12	4.19		125.1	181.4	235.9	252.4
E870	p8/16	4.19		165.0	239.4	311.1	332.9
E870	p8/20	4.19		205.0	297.3	386.4	413.5
E870	p8/24	4.19		244.0	353.7	459.9	492.1
E870	p8/28	4.19		282.9	410.2	533.3	570.7
E870	p8/32	4.19		321.9	466.7	606.7	649.2
E870	p8/36	4.19		360.8	523.2	680.1	727.8
E870	p8/40	4.19		399.8	579.7	753.6	806.4
E880	p8/8	4.35	32 core	88.0	127.5	165.8	177.5
E880	p8/12	4.35		129.8	188.1	244.6	261.7
E880	p8/16	4.35		171.5	248.8	323.4	346.0
E880	p8/20	4.35		212.3	307.8	400.2	428.1
E880	p8/24	4.35		253.0	366.9	476.9	510.4
E880	p8/28	4.35		293.8	426.0	553.8	592.5
E880	p8/32	4.35		334.5	485.0	630.6	674.8

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
E880C	p8/8	4.35	32 core	88.0	127.5	165.8	177.5
E880C	p8/12	4.35		129.8	188.1	244.6	261.7
E880C	p8/16	4.35		171.5	248.8	323.4	346.0
E880C	p8/20	4.35		212.3	307.8	400.2	428.1
E880C	p8/24	4.35		253.0	366.9	476.9	510.4
E880C	p8/28	4.35		293.8	426.0	553.8	592.5
E880C	p8/32	4.35		334.5	485.0	630.6	674.8
E880	p8/8	4.19	40 core	85.2	123.5	160.5	171.8
E880	p8/12	4.19		125.1	181.4	235.9	252.4
E880	p8/16	4.19		165.0	239.4	311.1	332.9
E880	p8/20	4.19		205.0	297.3	386.4	413.5
E880	p8/24	4.19		244.0	353.7	459.9	492.1
E880	p8/28	4.19		282.9	410.2	533.3	570.7
E880	p8/32	4.19		321.9	466.7	606.7	649.2
E880	p8/36	4.19		360.8	523.2	680.1	727.8
E880	p8/40	4.19		399.8	579.7	753.6	806.4
E880C	p8/8	4.19	40 core	85.2	123.5	160.5	171.8
E880C	p8/12	4.19		125.1	181.4	235.9	252.4
E880C	p8/16	4.19		165.0	239.4	311.1	332.9
E880C	p8/20	4.19		205.0	297.3	386.4	413.5
E880C	p8/24	4.19		244.0	353.7	459.9	492.1
E880C	p8/28	4.19		282.9	410.2	533.3	570.7
E880C	p8/32	4.19		321.9	466.7	606.7	649.2
E880C	p8/36	4.19		360.8	523.2	680.1	727.8
E880C	p8/40	4.19		399.8	579.7	753.6	806.4
				0.0	0.0	0.0	0.0
E880	p8/8	4.00	48 core	82.5	119.6	155.5	166.4
E880	p8/12	4.00		119.9	173.9	226.1	241.9
E880	p8/16	4.00		157.9	229.0	297.7	318.5
E880	p8/20	4.00		195.9	284.0	369.3	395.1
E880	p8/24	4.00		233.9	339.1	440.9	471.7
E880	p8/28	4.00		270.9	392.8	510.7	546.4
E880	p8/32	4.00		307.9	446.5	580.5	621.1
E880	p8/36	4.00		345.0	500.2	650.3	695.8
E880	p8/40	4.00		382.0	553.9	720.1	770.5
E880	p8/44	4.00		419.0	607.6	789.9	845.2
E880	p8/48	4.00		456.0	661.3	859.7	919.8
E880C	p8/8	4.00	48 core	82.5	119.6	155.5	166.4
E880C	p8/12	4.00		119.9	173.9	226.1	241.9
E880C	p8/16	4.00		157.9	229.0	297.7	318.5
E880C	p8/20	4.00		195.9	284.0	369.3	395.1
E880C	p8/24	4.00		233.9	339.1	440.9	471.7
E880C	p8/28	4.00		270.9	392.8	510.7	546.4
E880C	p8/32	4.00		307.9	446.5	580.5	621.1
E880C	p8/36	4.00		345.0	500.2	650.3	695.8
E880C	p8/40	4.00		382.0	553.9	720.1	770.5
E880C	p8/44	4.00		419.0	607.6	789.9	845.2
E880C	p8/48	4.00		456.0	661.3	859.7	919.8

*POWER9 frequency is expressed from Typical to max GHz

Section 2c – AIX POWER7 and up Capacity Upgrade on Demand Relative Performance Guidelines

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
770	P7/4	3.5	48 core			49.19	
770	P7/6	3.5				72.55	
770	P7/8	3.5				95.29	
770	P7/12	3.5				140.75	
770	P7/16	3.5				180.90	
770	P7/20	3.5				221.05	
770	P7/24	3.5				261.19	
770	P7/28	3.5				299.89	
770	P7/32	3.5				338.58	
770	P7/36	3.5				377.28	
770	P7/40	3.5				415.97	
770	P7/44	3.5				454.67	
770	P7/48	3.5				493.37	
770	P7/4	3.7	48 core			51.60	
770	P7/6	3.7				76.00	
770	P7/8	3.7				99.90	
770	P7/12	3.7				147.50	
770	P7/16	3.7				189.60	
770	P7/20	3.7				231.70	
770	P7/24	3.7				273.70	
770	P7/28	3.7				314.30	
770	P7/32	3.7				354.80	
770	P7/36	3.7				395.40	
770	P7/40	3.7				435.90	
770	P7/44	3.7				476.50	
770	P7/48	3.7				517.00	
770	P7/4	3.1	64 core			44.84	
770	P7/8	3.1				85.20	
770	P7/12	3.1				125.25	
770	P7/16	3.1				165.30	
770	P7/20	3.1				200.66	
770	P7/24	3.1				236.02	
770	P7/28	3.1				271.38	
770	P7/32	3.1				306.74	
770	P7/36	3.1				340.82	
770	P7/40	3.1				374.90	
770	P7/44	3.1				408.98	
770	P7/48	3.1				443.06	
770	P7/52	3.1				477.15	
770	P7/56	3.1				511.23	
770	P7/60	3.1				545.31	
770	P7/64	3.1				579.39	
770	P7/4	3.3	64 core			47.00	
770	P7/8	3.3				89.20	
770	P7/12	3.3				131.20	
770	P7/16	3.3				173.10	
770	P7/20	3.3				210.10	

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
770	P7/24	3.3				247.20	
770	P7/28	3.3				284.20	
770	P7/32	3.3				321.20	
770	P7/36	3.3				356.90	
770	P7/40	3.3				392.60	
770	P7/44	3.3				428.30	
770	P7/48	3.3				464.00	
770	P7/52	3.3				499.70	
770	P7/56	3.3				535.40	
770	P7/60	3.3				571.10	
770	P7/64	3.3				606.80	
770	P7+/4	4.22	48 core			64.10	
770	P7+/6	4.22				94.50	
770	P7+/8	4.22				124.40	
770	P7+/12	4.22				184.20	
770	P7+/16	4.22				237.80	
770	P7+/20	4.22				291.50	
770	P7+/24	4.22				345.10	
770	P7+/28	4.22				389.70	
770	P7+/32	4.22				434.30	
770	P7+/36	4.22				478.90	
770	P7+/40	4.22				523.50	
770	P7+/44	4.22				568.10	
770	P7+/48	4.22				612.70	
770	P7+/4	3.8	64 core			59.20	
770	P7+/8	3.8				112.50	
770	P7+/12	3.8				165.90	
770	P7+/16	3.8				219.30	
770	P7+/20	3.8				267.10	
770	P7+/24	3.8				315.00	
770	P7+/28	3.8				362.90	
770	P7+/32	3.8				410.80	
770	P7+/36	3.8				450.60	
770	P7+/40	3.8				490.40	
770	P7+/44	3.8				530.30	
770	P7+/48	3.8				570.10	
770	P7+/52	3.8				609.90	
770	P7+/56	3.8				649.70	
770	P7+/60	3.8				689.50	
770	P7+/64	3.8				729.30	
780	P7/4	3.86	64 core			53.03	
780	P7/8	3.86				100.75	
780	P7/12	3.86				148.10	
780	P7/16	3.86				195.45	
780	P7/20	3.86				237.26	
780	P7/24	3.86				279.07	
780	P7/28	3.86				320.88	
780	P7/32	3.86				362.70	
780	P7/36	3.86				403.00	
780	P7/40	3.86				443.29	
780	P7/44	3.86				483.59	
780	P7/48	3.86				523.89	

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
780	P7/52	3.86				564.19	
780	P7/56	3.86				604.49	
780	P7/60	3.86				644.79	
780	P7/64	3.86				685.09	
780	P7/4	3.92	64 core			53.60	
780	P7/8	3.92				101.80	
780	P7/12	3.92				149.70	
780	P7/16	3.92				197.60	
780	P7/20	3.92				239.80	
780	P7/24	3.92				282.10	
780	P7/28	3.92				324.40	
780	P7/32	3.92				366.60	
780	P7/36	3.92				407.40	
780	P7/40	3.92				448.10	
780	P7/44	3.92				488.90	
780	P7/48	3.92				529.60	
780	P7/52	3.92				570.30	
780	P7/56	3.92				611.10	
780	P7/60	3.92				651.80	
780	P7/64	3.92				692.50	
780	P7/4	4.14	32 core			59.26	
780	P7/8	4.14				115.86	
780	P7/12	4.14				171.42	
780	P7/16	4.14				226.97	
780	P7/20	4.14				276.61	
780	P7/24	4.14				326.24	
780	P7/28	4.14				375.87	
780	P7/32	4.14				425.50	
780	P7/4	3.44	48 core			48.60	
780	P7/6	3.44				71.70	
780	P7/8	3.44				93.90	
780	P7/12	3.44				138.40	
780	P7/16	3.44				176.70	
780	P7/20	3.44				215.00	
780	P7/24	3.44				253.30	
780	P7/28	3.44				285.00	
780	P7/32	3.44				316.60	
780	P7/36	3.44				348.30	
780	P7/40	3.44				380.00	
780	P7/44	3.44				411.60	
780	P7/48	3.44				443.30	
780	P7+/4	4.42	64 core			66.30	
780	P7+/8	4.42				126.10	
780	P7+/12	4.42				185.90	
780	P7+/16	4.42				245.70	
780	P7+/20	4.42				299.30	
780	P7+/24	4.42				353.00	
780	P7+/28	4.42				406.60	
780	P7+/32	4.42				460.30	
780	P7+/36	4.42				504.90	
780	P7+/40	4.42				549.50	

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
780	P7+/44	4.42				594.10	
780	P7+/48	4.42				638.70	
780	P7+/52	4.42				683.30	
780	P7+/56	4.42				727.90	
780	P7+/60	4.42				772.50	
780	P7+/64	4.42				817.10	
780	P7+/4	3.72	64 core			56.80	
780	P7+/8	3.72				107.80	
780	P7+/12	3.72				157.40	
780	P7+/16	3.72				207.00	
780	P7+/20	3.72				251.20	
780	P7+/24	3.72				295.40	
780	P7+/28	3.72				339.70	
780	P7+/32	3.72				383.90	
780	P7+/36	3.72				422.10	
780	P7+/40	3.72				460.40	
780	P7+/44	3.72				498.70	
780	P7+/48	3.72				537.00	
780	P7+/52	3.72				575.30	
780	P7+/56	3.72				613.50	
780	P7+/60	3.72				651.80	
780	P7+/64	3.72				690.10	
795	P7/6	3.7	64 core			75.97	
795	P7/8	3.7				99.78	
795	P7/12	3.7				147.39	
795	P7/16	3.7				189.43	
795	P7/20	3.7				231.47	
795	P7/24	3.7				273.51	
795	P7/28	3.7				314.03	
795	P7/32	3.7				354.55	
795	P7/36	3.7				395.07	
795	P7/40	3.7				435.58	
795	P7/44	3.7				476.10	
795	P7/48	3.7				516.62	
795	P7/52	3.7				548.91	
795	P7/56	3.7				581.20	
795	P7/60	3.7				613.49	
795	P7/64	3.7				645.78	
795	P7/8	4.00	64 core			103.41	
795	P7/12	4.00				152.01	
795	P7/16	4.00				200.61	
795	P7/20	4.00				243.53	
795	P7/24	4.00				286.44	
795	P7/28	4.00				329.36	
795	P7/32	4.00				372.27	
795	P7/36	4.00				413.63	
795	P7/40	4.00				455.00	
795	P7/44	4.00				496.36	
795	P7/48	4.00				537.72	
795	P7/52	4.00				579.09	
795	P7/56	4.00				620.45	
795	P7/60	4.00				661.81	

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
795	P7/64	4.00				703.18	
795	P7/4	4.25	64 core			60.46	
795	P7/8	4.25				118.21	
795	P7/12	4.25				174.89	
795	P7/16	4.25				231.57	
795	P7/20	4.25				282.21	
795	P7/24	4.25				332.85	
795	P7/28	4.25				383.49	
795	P7/32	4.25				434.13	
795	P7/36	4.25				477.00	
795	P7/40	4.25				519.87	
795	P7/44	4.25				562.74	
795	P7/48	4.25				605.61	
795	P7/52	4.25				648.48	
795	P7/56	4.25				691.35	
795	P7/60	4.25				734.22	
795	P7/64	4.25				777.09	

Section 2d – POWER8 and up CPW Published Results

All POWER8 and POWER9 results in this table reflect performance with firmware and Operating System updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017-5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	# Cores	GHz*	# x LPARs	CPW
S812	1	3.02		9,360
S822	2	3.42		21,800
S822	2	3.89		24,170
S822	2	4.15		25,600
S822	4	3.42		42,470
S822	4	3.89		45,220
S822	4	4.15		49,960
S922	4	3.4 – 3.9		68,000
S922	4	2.9 – 3.8		60,000
S814	4	3.02		37,440
S814	6	3.02		56,400
S814	8	3.72		81,050
S914	4	2.3 – 3.8		52,500
S914	6	2.3 – 3.8		78,500
S914	8	2.8 – 3.8		122,500
S824	6	3.89		68,250
S824	12	3.89		123,240
S824	8	4.15		89,580
S824	16	4.15		164,470
S824	24	3.52		218,510
S924	8	3.8 – 4.0		145,500
S924	16	3.8 – 4.0		268,500
S924	10	3.5 – 3.9		174,500
S924	20	3.5 – 3.9		318,000
S924	24	3.4 – 3.9		370,700
E870	32	4.02	1x32	340,330

E870	64	4.02	2x32	674,020
E870	40	4.19	1x40	436,080
E870	80	4.19	2x40	863,620
E870C	32	4.02	1x32	340,330
E870C	64	4.02	2x32	674,020
E880	40	4.19	1x40	436,080
E880	80	4.19	2x40	863,620
E880	120	4.19	3x40	1,291,170
E880	160	4.19	4x40	1,718,720
E880	32	4.35	1x32	361,180
E880	64	4.35	2x32	715,740
E880	96	4.35	3x32	1,084,510
E880	128	4.35	4x32	1,443,800
E880	48	4.02	1x48	491,060
E880	96	4.02	2x48	980,230
E880	144	4.02	3x48	1,470,340
E880	192	4.02	4x48	1,961,410
E880C	32	4.35	1x32	361,180
E880C	64	4.35	2x32	715,740
E880C	96	4.35	3x32	1,084,510
E880C	128	4.35	4x32	1,443,800
E880C	40	4.19	1x40	436,080
E880C	80	4.19	2x40	863,620
E880C	120	4.19	3x40	1,291,170
E880C	160	4.19	4x40	1,718,720
E880C	48	4.02	1x48	491,060
E880C	96	4.02	2x48	980,230
E880C	144	4.02	3x48	1,470,340
E880C	192	4.02	4x48	1,961,410

*POWER9 frequency is expressed from Typical to max GHz

Section 2e – POWER 7 and POWER7+ CPW Published Results

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	# Cores	GHz	CPW
PS700	4	3.0	21100%
PS701	8	3.0	42100%%
PS702	16	3.0	76300##
PS703	16	2.4	64,000##
PS704	32	2.4	110,000###
PFlex260	4	4.0	25400 %%%
PFlex260	8 (2x4c)	3.3	38,500#
PFlex260	16	3.22	80,500##
PFlex260	16	3.55	87,000##
PFlex260	8 (2x4c)	4.0	51400#
PFlex260	16	3.6	99500##
PFlex260	16	4.1	110000##
PFlex270	24	3.1	123500 &&
PFlex270	24	3.4	131500 &&
PFlex460	16 (4x4c)	3.3	80,500##
PFlex460	32	3.22	150,000###

PFlex460	32	3.55	162,000###
PFlex460	16	4.0	109500 &
PFlex460	32	3.6	198900 &&&
PFlex460	32	4.1	219900 &&&
710	4	3.0	23,800
710	6	3.7	40,900
710	8	3.55	51,800
710	4	3.6	28400
710	6	4.2	49400
710	8	4.2	64500
720	4	3.0	23,800
720	6	3.0	34,900
720	8	3.0	46,300
720	4	3.6	28400
720	6	3.6	42400
720	8	3.6	56300
730	8	3.0	44,600
730	8	3.7	51,900
730	12	3.7	77,200
730	16	3.55	97,700
730	8	4.3	59700
730	12	4.2	89200
730	16	3.6	104700
730	16	4.2	117600
740	4	3.3	25,500
740	4	3.7	27,900
740	6	3.7	41,600
740	8	3.3	47,800
740	8	3.7	52,200
740	12	3.7	77,200
740	16	3.55	97,700
740	6	4.2	49000
740	12	4.2	91700
740	8	3.6	56300
740	16	3.6	106500
740	8	4.2	64500
740	16	4.2	120000
750	8	3.0	44600
750	16	3.0	82600
750	24	3.0	122500
750	32	3.0	158300
750	6	3.3	37200
750	12	3.3	69200
750	18	3.3	94900
750	24	3.3	135300
750	8	3.3	47800
750	16	3.3	88700
750	24	3.3	129700
750	32	3.3	168800
750	8	3.55	52,200
750	16	3.55	95,700
750	24	3.55	138,500
750	32	3.55	181000
750	8	3.20	47,800
750	16	3.20	89,600
750	24	3.20	131,500
750	32	3.20	171,400
750	8	3.60	52,700

750	16	3.60	97,000
750	24	3.60	141,400
750	32	3.60	183,200
750	4	3.70	27,300
750	8	3.70	51,000
750	12	3.70	74,700
750	16	3.70	97,700
750	6	3.70	40,800
750	12	3.70	75,500
750	18	3.70	109,100
750	24	3.55	145,600
750	8	4.0	59000
750	16	4.0	108000
750	24	4.0	158000
750	32	4.0	208000
750	8	3.5	52000
750	16	3.5	96000
750	24	3.5	141500
750	32	3.5	185000
760	12	3.1	69800
760	24	3.1	129000
760	36	3.1	195700
760	48	3.1	258000
760	12	3.4	75200
760	24	3.4	137000
760*	36	3.4	209000
760*	48	3.4	274000
770	4	3.1	22750
770	8	3.1	45000
770	16	3.1	88800
770	32	3.1	155850
770	48	3.1	229800*
770	64	3.1	292700*
770	4	3.5	24900
770	6	3.5	37400
770	12	3.5	73100
770	18	3.5	99000
770	24	3.5	131050
770	48	3.5	248550*
770	4	4.22	30700
770	6	4.22	45800
770	9	4.22	68200
770	12	4.22	90000
770	24	4.22	154800
770	36	4.22	242600*
770	48	4.22	306600*
770	4	3.8	28700
770	8	3.8	56100
770	16	3.8	110000
770	24	3.8	146700
770	32	3.8	191500
770	48	3.8	290500*
770	64	3.8	379300*
780	4	3.8	26600
780	8	3.8	54400
780	16	3.8	105200

780	32	3.8	177400
780	48	3.8	265200*
780	64	3.8	343050*
780	8	4.1	57450
780	16	4.1	114850**
780	24	4.1	172450**
780	32	4.1	229650**
780	4	4.42	32400
780	8	4.42	63200
780	16	4.42	123500
780	24	4.42	164700
780	32	4.42	214000
780	48	4.42	326100*
780	64	4.42	424400*
780	4	3.72	28500
780	8	3.72	56000
780	16	3.72	108500
780	24	3.72	159600
780	32	3.72	209500
780	64	3.72	414900*
780	96	3.72	622300*
780	128	3.72	829800*
795	24	3.7	149,100
795	48	3.7	288,500*
795	32	4.0	204,300
795	64	4.0	399,200*
795	24	4.25	162,100
795	32	4.25	218,400***

* CPW is limited to 32 core partition sizes. Larger core configurations were measured with two partitions.

** CPW values for the Power 780 with TurboCore enabled were measured with 8 core partitions.

*** CPW value for the 32 core Power 795 with TurboCore enabled was measured with 16 core partitions

@ CPW value for 1.8 cores of 2 total cores. 0.2 core is allocated for VIOS

% CPW value for 3.7 cores of 4 total cores. 0.3 core is allocated for VIOS

%% CPW value for 7.5 cores of 8 total cores. 0.5 core is allocated for VIOS

%%% CPW value for 3.5 cores of 4 cores. 0.5 core is allocated for VIOS

CPW value for 7 cores of 8 total cores. 1 core is allocated for VIOS.

CPW value for 15 cores of 16 total cores. 1 core is allocated for VIOS.

CPW value for 30 cores of 32 total cores. 2 cores are allocated for VIOS.

& CPW value for 15 cores of 16 total cores. 1 core is allocated for VIOS.

&& CPW value for 23 cores of 24 total cores. 1 core is allocated for VIOS.

&&& CPW value for 31 cores of 32 total cores. 1 core is allocated for VIOS.

CPW values for POWER System i™ models not listed may be obtained from

<http://www.ibm.com/systems/i/solutions/perfmgmt/resource.html> .

Section 3 - . Java Benchmarks (SPECjbb2015 Published Results)

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model	Proc /	GHz	L1	L2/L3/L4	SPECjbb2015-MultiJVM		Linux Version
	# Cores		Cache (KB)	Cache (MB)	max-jOPS	critical-jOPS	
S812LC	p8/10	2.92	32/64	5/80/32	44,883	13,032	Ubuntu 14.04.3

Section 4 – AIX SAP Standard Application Benchmarks Published Results

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Sales and Distribution – SD 2-Tier – AIX

Model (GHz)	# Core (Proc/Thread)	Users	Avg. Resp. Time	Dialog Steps Per Hour (K)	Fully Proc. Line Items Per Hour	SAPS (K)	OS	Database	CPU Util. %	SAP ECC Ver.	Cert. #
550 P6 5.0 GHz	8 (4/16)	3752	.97	1,231	410,330	20.52	AIX 6.1	DB2 9.5	99%	EHP4	2009023
730 p7+, 4.2	12 (2/48)	7,000	.91	2,311	770,330	38.52	AIX 7.1	Sybase ASE 15.7	99%	EHP5	2013024
730 P7 3.55	16 (2/64)	8,704	.97	2,856	952,000	47.60	AIX 7.1	DB2 9.7	99%	EHP4	2011011
PFlex260 p7+ 4.11	16 (2/64)	10,000	.97	3,282	1,094,000	54.7	AIX 7.1	DB2 10	99%	EHP5	2012035
PFlex270 p7+ 3.4	24 (2/96)	12,528	.99	4,103	1,367,670	68.38	AIX 7.1	DB2 10.5	99%	EHP5	2013019
S824 P8 3.52	24 (4/192)	21,212	.98	6,952	2,317,330	115.87	AIX 7.1	DB2 10.5	99%	EHP5	2014016
750 P7 3.55	32 (4/128)	15,600	.99	5,113	1,704,330	85.22	AIX 6.1	DB2 9.7	99%	EHP4	2010004
PFlex460 P7 3.55	32 (4/128)	17,000	.96	5,585	1,861,670	93.08	AIX 7.1	DB2 9.7	99%	EHP4	2012015
750 P7 3.55	32 (4/128)	17,312	.96	5,684	1,894,670	94.73	AIX 7.1	DB2 9.7	99%	EHP4	2011043
760 P7+ 3.4	48 (8/192)	25,488	.99	8,353	2,784,330	139.22	AIX 7.1	DB2 10	99%	EHP5	2013004
E870 P8 4.19	80 (8/640)	79,750	.97	26,166	8,722,000	436.1	AIX 7.1	DB2 10.5	99%	EHP5	2014034
780 P7 3.8	64 (8/256)	37,000	.98	12,131	4,043,670	202.18	AIX 6.1	DB2 9.7	99%	EHP4	2010013
780 P7+ 3.7	96 (12/384)	57,024	.98	18,703	6,234,330	311.72	AIX 7.1	DB2 10	99%	EHP5	2012033
795 P7 4.0	128 (16/512)	70,032	.93	23,060	7,686,670	384.33	AIX 7.1	DB2 9.7	99%	EHP4	2010042
795 P7 4.0	256 (32/1024)	126,063	.98	41,318	13,772,670	688.63	AIX 7.1	DB2 9.7	96%	EHP4	2010046

* The SAP certification number was not available at press time and can be found at www.sap.com/benchmark.

Section 4a – SAP Sales and Distribution – SD 2-Tier – Linux on Power

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model (GHz)	# Core (Proc/Thread)	SD Users	Avg. Resp. Time	Dialog Steps Per Hour (K)	Fully Proc. Line Items Per Hour	SAPS (K)	OS	Database	CPU Util. %	SAP ECC Ver.	Cert. #
p5-550 P5 (1.9)	4 (2/8)	1000	1.97	301	100,330	5.02	SLES 9	DB2 V8.2.2	99%	5.0	2005040
p5-570 P5 (1.9)	8 (4/16)	2000	1.95	603	210,000	10.05	SLES9	DB2 V8.2.2	99%	4.7	2004057
570 P6 (4.2)	8 (4/16)	3104	1.91	938	312,670	15.63	RHEL5.1	DB2 9.5	97%	6.0	2008002
730 P7 (3.7)	12 (2/24)	5250	.98	1,721	573,670	28.68	SLES11	DB2 9.7	97%	EHP4	2011022
730 P7 (3.55)	16 (2/64)	7000	.99	2,293	764,330	38.22	SLES11	DB2 9.7	97%	EHP4	2011042
7R2 p7+ (4.22)	16 (2/64)	8016	.98	2,628	876,000	43.80	SLES 11	DB2 10	99%	EHP5	2013003
7R2 p7+ (4.22)	16 (2/64)	8256	.97	2,709	903,000	45.13	RHEL6.4	DB2 10	99%	EHP5	2013006

* The SAP certification number was not available at press time and can be found at www.sap.com/benchmark.

Section 4b: BW-EML — Linux on Power

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Model (GHz)	# Core (Proc/ Thread)	DB MEM (GB)	Record count	Nav. Steps per hour (K)	OS (DB)	Database	CPU Util. %	Net weaver Ver.	Cert. #
E870 P8 (4.19)	40 (4/320)	1024	2 B	192.75	SLES 11	Hana 1.0	91%	7.31	2015024

* The SAP certification number was not available

Section 5 – AIX Oracle e-Business Suite (eBS) Benchmarks Published Results

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

R12 – 12.1.3 Payroll Batch Results

Model	GHz	Cores (Proc/ threads)	Checks /Hour	Kit	Average CPU util.	Batch: Payroll Employees	App level	Tiers
Power S824	3.52	12 (2/48)	1,090,909	ExLrg	53%	250,000	12.1.3	2-Tier

Section 6 – AIX Siebel Benchmarks Published Results

Performance results (in this section) published before 2/27/2018 do not include firmware and operating system security updates to mitigate Common Vulnerabilities and Exposures issue numbers CVE-2017-5715, CVE-2017- 5753 and CVE-2017-5754 known as Spectre and Meltdown.

Siebel CRM 8.1 Industry Applications Performance and Scalability Benchmark

DB Server	# Cores / Memory	App./Gateway Servers	# Cores / Memory	Concurrent Users	Application Version	Database
S824 p8 4.1	6/224GB	3 x S824 p8 4.1GHz	16/448GB	50,000	8.1.1.4	Oracle 11gR2
740 P7 3.55	6/64GB	2x 750 P7 3.55GHz	16/256GB	21,000	8.1.1.4	Oracle 11gR2

Notes on Performance Benchmarks and Values

The performance benchmarks and the values shown here were derived using particular, well configured, development-level computer systems. Unless otherwise indicated for a system, the values were derived using external cache if external cache is supported on the system. All performance benchmark values are provided "AS IS" and no warranties or guarantees are expressed or implied by IBM. Actual system performance may vary and is dependent upon many factors including system hardware configuration and software design and configuration. Buyers should consult other sources of information to evaluate the performance of systems they are considering buying and should consider conducting application oriented testing. For additional information about the performance benchmarks, values and systems tested, please contact your IBM local Branch Office or IBM Authorized Reseller or access the following on the Web:

SPEC - <http://www.spec.org>

All performance measurements for the IBM Power and IBM PowerLinux, with systems running AIX or AIX 5L operating systems unless otherwise indicated to have used Linux. For new and upgraded systems, the latest versions of AIX were used. All other systems used previous versions of AIX.

The SPEC CPU2006 were compiled using IBM's high performance C, C++, and FORTRAN compilers for AIX and Linux. For new and upgraded systems, the latest versions of these compilers were used.

The following SPEC benchmarks reflect the performance of the microprocessor, memory architecture and compiler of the tested system:

SPECint2006 - New SPEC component-level benchmark that measures integer performance. Result is the geometric mean of twelve tests that comprise the CINT2006 benchmark suite.

SPECint_base2006 - The result of the same tests in CINT2006 with the same compiler options that must be used in all twelve tests.

SPECint_rate2006 - Geometric average of the twelve SPEC rates from the SPEC integer tests (CINT2006).

SPECint_rate_base2006 - The result of the same tests as CINT2006 with the same compiler options that must be used in all twelve tests.

SPECfp2006 - New SPEC component-level benchmark that measures floating-point performance. Result is the geometric mean of seventeen tests, all written in FORTRAN and C languages that are included in the CFP2006 benchmark suite.

SPECfp_base2006 - The result of the same tests in CFP2006 with the same compiler options that must be used in all seventeen tests.

SPECjbb2015 - This benchmark measures Java performance. Performance metrics are provided for both pure throughput and critical throughput under service-level agreements (SLAs), with response times ranging from 10 to 100 milliseconds.

Notes on Performance Estimates

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, OLTP 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 POWER9 systems is identical to that used for the POWER8 systems. Variations in incremental system performance may be observed in commercial workloads due to changes in the underlying system architecture.

Commercial Processing Workload (CPW) is a relative measure of performance of processors running the IBM i operating system. Performance in client environments may vary. The value is based on maximum configurations. More performance information is available in the Performance Capabilities Reference at:
<http://www.ibm.com/systems/i/solutions/perfmgmt/resource.html> .

All performance 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, and application sizing guides to evaluate the performance of a system they are considering buying. For additional information about rPerf and CPW, contact your local IBM office or IBM authorized reseller.

Application Benchmarks

SAP - Benchmark overview information: <http://www.sap.com/benchmark/>

Oracle Applications - Benchmark overview information:
http://www.oracle.com/apps_benchmark/html/results.html



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The BladeCenter home page on the Internet can be found at <http://www.ibm.com/systems/bladecenter>.

More information about PowerLinux page on the Internet can be found at <http://www.ibm.com/systems/power/software/linux/powerlinux>

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