



IBM Power Systems Performance Report

POWER7 to POWER9

February 14, 2019

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Introduction to Performance of IBM UNIX, IBM i and Linux Operating System Servers

February 2019

This document contains performance and benchmark results for IBM Power™ Systems servers and IBM PowerLinux servers that run the UNIX® (AIX®), IBM i and Linux® operating systems. IBM BladeCenter blades results are for systems running the AIX operating system unless otherwise indicated.

This release contains rPerf results for new offerings of E950.

Changes from December 4, 2018 version are highlighted thus.

Archived report can be found here: <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=POO03019USEN&>

Section 1 – SPEC® CPU Benchmark Performance

Section 1a – Linux Multi-user SPEC® CPU2017 Performance (POWER9)

All 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	GHz	Inst/Data	Cache	SPECrate2017		OS Version
			Cache L1 (KB) Per core	L2/L3/L4 (MB)/ System	_int_peak	_int_base	
S924	p9/24	3.4 – 3.9	64/64	12/240/-	277	213	SLES 12 SP3
E950 ¹	p9/40	3.4 – 3.8	64/64	20/400/512	475	392	SLES 12 SP3

NOTE: POWER9 frequency is expressed as a range from Typical GHz to Max GHz.

NOTE: The S924 and E950 by default will have its Power Management mode set to Max Performance. This mode dynamically optimizes the processor frequency at any given time based on CPU utilization and operating environmental conditions.

FOOTNOTE 1: E950 performance numbers have been submitted for review and publication.

Section 1b – AIX Multi-user SPEC® CPU2006 Performance (POWER7, POWER7+, POWER8)

Performance results in this table 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	Inst/Data	Cache	SPECrate2006			
			Cache L1 (KB) Per core	L2/L3/L4 (MB)/ System	_int_peak	_int_base	_fp_peak	_fp_base
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	1,740	1,230	1,200	995
E850	p8/32	3.72	32/64	16/256/512	2,240	1,780	--	--
755	P7/32	3.30	32/32	8/128	1,010	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

Model	Processor / # Cores	GHz	Inst/Data	Cache	SPECrate2006 _int_peak	SPECrate2006 _int_base	SPECrate2006 _fp_peak	SPECrate2006 _fp_base
			Cache L1 (KB) Per core	L2/L3/L4 (MB)/ System				
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	9,730

Section 1c – Linux Multi-user SPEC® CPU2006 Performance (POWER7, POWER7+, POWER8)

Performance results in this table 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	Cache	SPECrate2006 _int_peak	SPECrate2006 _int_base	SPECrate2006 _fp_peak	SPECrate2006 _fp_base	Linux Version
			L1(KB) Per Core	L2/L3/L4 (MB)/ System					
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

Model	Processor/ # Cores	GHz	Cache		SPECrate2006 _int_peak	SPECrate2006 _int_base	SPECrate2006 _fp_peak	SPECrate2006 _fp_base	Linux Version
			L1(KB) Per Core	L2/L3/L4 (MB)/ System					
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 Multi-user Performance (rPerf)

Section 2a – AIX Multi-user Performance (POWER8 and POWER9)

All 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	Inst/Data		LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	Cache L2/L3/L4 (MB)/ System					
S812	P8/4	3.00	32/64	2/32/128	4	31.3	45.3	58.9	63.0
S822	P8/4	3.00	32/64	2/32/128	4	31.3	45.3	58.9	63.0
S822	P8/6	3.80	32/64	3/48/128	6	56.4	81.9	106.4	113.8
S822	P8/8	4.15	32/64	4/64/128	8	77.5	112.4	146.1	--
S822	P8/10	3.40	32/64	5/80/128	10	83.1	120.4	156.6	167.5
S822	P8/8	3.00	32/64	4/64/128	8	60.9	88.4	114.8	122.9
S822	P8/12	3.80	32/64	6/96/256	12	110.0	159.6	207.4	221.9
S822	P8/16	4.15	32/64	8/128/256	16	151.1	219.2	284.9	--
S822	P8/20	3.40	32/64	10/160/256	20	161.9	234.8	305.2	326.6
S922	p9/4	2.8 – 3.8	64/64	2/40/-	4	30.4	51.6	71.2	89.8
S922	p9/8	3.4 – 3.9	64/64	4/80/-	8	68.4	116.3	160.5	202.3
S922	p9/16	3.4 – 3.9	64/64	8/160/-	16	133.4	226.9	313.1	394.5
S922	p9/10	2.9 – 3.8	64/64	5/100/-	10	74.0	125.7	173.5	218.6
S922	p9/20	2.9 – 3.8	64/64	10/200/-	20	144.2	245.2	338.4	426.4
S814	P8/4	3.00	32/64	2/32/128	4	31.3	45.3	58.9	63.0
S814	P8/6	3.00	32/64	3/48/128	6	45.5	66.0	85.8	91.8
S814	P8/8	3.70	32/64	4/64/128	8	67.3	97.5	126.7	135.6
S914	p9/4	2.3 – 3.8	64/64	2/40/-	4	27.4	46.6	64.2	80.9
S914	p9/6	2.3 – 3.8	64/64	3/60/-	6	40.1	68.2	94.1	118.6
S914	p9/8	2.8 – 3.8	64/64	4/80/-	8	62.0	105.4	145.4	183.2
S824	P8/6	3.80	32/64	3/48/128	6	56.4	81.9	106.4	113.8
S824	P8/8	4.10	32/64	4/64/128	8	77.5	112.4	146.1	156.4
S824	P8/12	3.80	32/64	6/96/256	12	110.0	159.6	207.4	221.9
S824	P8/16	4.10	32/64	8/128/256	16	151.1	219.2	284.9	304.8
S824	P8/24	3.50	32/64	12/192/256	24	197.0	285.6	371.3	397.3
S924	p9/8	3.8 – 4.0	64/64	4/80/-	8	74.2	126.2	174.1	219.4
S924	p9/16	3.8 – 4.0	64/64	8/160/-	16	144.7	246.0	339.5	427.8

Model	Processor / # Cores	Freq. GHz	Inst/Data	Cache	LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	L2/L3/L4 (MB)/ System					
S924	p9/10	3.5 – 3.9	64/64	5/100/-	10	86.6	147.3	203.3	256.1
S924	p9/20	3.5 – 3.9	64/64	10/200/-	20	169.0	287.2	396.4	499.5
S924	p9/24	3.4 – 3.9	64/64	12/240/-	24	197.2	335.3	462.7	583.1
E850	p8/16	3.72	32/64	8/128/256	16	142.2	206.2	268.1	286.8
E850	p8/24	3.72	32/64	12/192/384	24	209.8	304.2	395.5	423.1
E850	p8/32	3.72	32/64	16/256/512	32	277.3	402.1	522.8	559.4
E850	p8/20	3.35	32/64	10/160/256	20	162.4	235.6	306.2	327.6
E850	p8/30	3.35	32/64	15/240/384	30	239.6	347.4	451.7	483.2
E850	p8/40	3.35	32/64	20/320/512	40	316.8	459.3	597.1	639.0
E850	p8/24	3.02	32/64	12/192/256	24	178.9	259.4	337.2	360.8
E850	p8/36	3.02	32/64	18/288/384	36	263.9	382.6	497.4	532.2
E850	p8/48	3.02	32/64	24/384/512	48	348.8	505.9	657.6	703.6
E850C	p8/16	4.22	32/64	8/128/256	16	156.3	226.6	294.7	315.3
E850C	p8/24	4.22	32/64	12/192/384	24	230.6	334.3	434.6	465.1
E850C	p8/32	4.22	32/64	16/256/512	32	304.8	442.0	574.6	614.8
E850C	p8/20	3.95	32/64	10/160/256	20	183.6	266.2	346.1	370.3
E850C	p8/30	3.95	32/64	15/240/384	30	270.8	392.6	510.5	546.2
E850C	p8/40	3.95	32/64	20/320/512	40	358.0	519.1	674.8	722.0
E850C	p8/24	3.65	32/64	12/192/256	24	205.8	298.4	388.0	415.1
E850C	p8/36	3.65	32/64	18/288/384	36	303.6	440.2	572.3	612.3
E850C	p8/48	3.65	32/64	24/384/512	48	401.4	582.0	756.5	809.5
E950	P9/16	3.6 – 3.8	64/64	8/160/256	16	151.0	256.7	354.2	446.3
E950	P9/20	3.4 – 3.8	64/64	10/200/256	20	179.4	304.9	420.8	530.2
E950	P9/22	3.2 – 3.8	64/64	11/220/256	22	185.9	316.1	436.2	549.6
E950	P9/24	3.15 – 3.8	64/64	12/240/256	24	198.9	338.1	466.5	587.8
E950	P9/24	3.6 – 3.8	64/64	12/240/384	24	222.7	378.6	522.4	658.2
E950	P9/30	3.4 – 3.8	64/64	15/300/384	30	264.6	449.8	620.7	782.0
E950	P9/33	3.2 – 3.8	64/64	16.5/330/384	33	274.2	466.2	643.3	810.6
E950	P9/36	3.15 – 3.8	64/64	18/360/384	36	291.3	498.6	688.1	867.0
E950	P9/32	3.6 – 3.8	64/64	16/320/512	32	294.4	500.6	690.8	870.4
E950	P9/40	3.4 – 3.8	64/64	20/400/512	40	349.8	594.7	820.7	1,034.1
E950	P9/44	3.2 – 3.8	64/64	22/440/512	44	362.6	616.4	850.7	1,071.9
E950	P9/48	3.15 – 3.8	64/64	24/480/512	48	387.8	659.3	909.9	1,146.4
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
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	p8/88	4.00	32/64	44/704/1024	40/48	840.4	1,218.6	1,584.2	1,695.1
E880	p8/96	4.00	32/64	48/768/1024	48	912.0	1,322.6	1,719.2	1,839.6
E880	p8/128	4.00	32/64	64/1024/1536	40/48	1,224.8	1,776.0	2,308.8	2,470.4
E880	p8/136	4.00	32/64	68/1088/1536	40/48	1,296.5	1,879.9	2,443.9	2,614.9
E880	p8/144	4.00	32/64	72/1152/1536	48	1,368.2	1,983.8	2,578.9	2,759.4
E880	p8/168	4.00	32/64	84/1344/2048	40/48	1,609.2	2,333.4	3,033.4	3,245.7
E880	p8/176	4.00	32/64	88/1408/2048	40/48	1,680.9	2,437.3	3,168.4	3,390.2
E880	p8/184	4.00	32/64	92/1472/2048	40/48	1,752.5	2,541.2	3,303.5	3,534.7

Model	Processor / # Cores	Freq. GHz	Inst/Data	Cache	LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	L2/L3/L4 (MB)/ System					
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	p8/88	4.00	32/64	44/704/1024	40/48	840.4	1,218.6	1,584.2	1,695.1
E880C	p8/96	4.00	32/64	48/768/1024	48	912.0	1,322.6	1,719.2	1,839.6
E880C	p8/128	4.00	32/64	64/1024/1536	40/48	1,224.8	1,776.0	2,308.8	2,470.4
E880C	p8/136	4.00	32/64	68/1088/1536	40/48	1,296.5	1,879.9	2,443.9	2,614.9
E880C	p8/144	4.00	32/64	72/1152/1536	48	1,368.2	1,983.8	2,578.9	2,759.4
E880C	p8/168	4.00	32/64	84/1344/2048	40/48	1,609.2	2,333.4	3,033.4	3,245.7
E880C	p8/176	4.00	32/64	88/1408/2048	40/48	1,680.9	2,437.3	3,168.4	3,390.2
E880C	p8/184	4.00	32/64	92/1472/2048	40/48	1,752.5	2,541.2	3,303.5	3,534.7
E880C	p8/192	4.00	32/64	96/1536/2048	48	1,824.2	2,645.0	3,438.6	3,679.3
E980	p9/32	3.9 – 4.0	64/64	16/320/512	32	307.8	523.3	722.2	910.0
E980	p9/64	3.9 – 4.0	64/64	32/640/1024	32	615.7	1,046.7	1,444.4	1,820.0
E980	p9/96	3.9 – 4.0	64/64	48/960/1536	32	923.5	1,570.0	2,166.6	2,729.9
E980	p9/128	3.9 – 4.0	64/64	64/1280/2048	32	1,231.4	2,093.4	2,888.8	3,639.9
E980	p9/40	3.7 – 3.9	64/64	20/400/512	40	371.5	631.5	871.5	1,098.1
E980	p9/80	3.7 – 3.9	64/64	40/800/1024	40	743.0	1,263.1	1,743.0	2,196.2
E980	p9/120	3.7 – 3.9	64/64	60/1200/1536	40	1,114.5	1,894.6	2,614.5	3,294.3
E980	p9/160	3.7 – 3.9	64/64	80/1600/2048	40	1,486.0	2,526.1	3,486.0	4,392.4
E980	p9/44	3.58 – 3.9	64/64	22/440/512	44	399.7	679.5	937.7	1,181.4
E980	p9/88	3.58 – 3.9	64/64	44/880/1024	44	799.4	1,358.9	1,875.3	2,362.9
E980	p9/132	3.58 – 3.9	64/64	66/1320/1536	44	1,199.0	2,038.4	2,813.0	3,544.3
E980	p9/176	3.58 – 3.9	64/64	88/1760/2048	44	1,598.7	2,717.8	3,750.6	4,725.8
E980	p9/48	3.55 – 3.9	64/64	24/480/512	48	429.7	730.5	1,008.1	1,270.2
E980	p9/96	3.55 – 3.9	64/64	48/960/1024	48	859.4	1,461.0	2,016.2	2,540.4
E980	p9/144	3.55 – 3.9	64/64	72/1440/1536	48	1,289.1	2,191.5	3,024.2	3,810.6
E980	p9/192	3.55 – 3.9	64/64	96/1920/2048	48	1,718.8	2,922.0	4,032.3	5,080.7

NOTE: POWER9 frequency is expressed as a range from Typical GHz to Max GHz.

NOTE: Up to 5% additional rPerf may be realized for POWER7 and POWER8 systems with Intelligent Energy Optimization enabled depending on the system.

NOTE: The S922, S924, E950, and E980 systems by default will have its Power Management mode set to Max Performance. The S914 system by default will have its Power Management mode set to Dynamic Performance. Both modes dynamically optimize the processor frequency at any given time based on CPU utilization and operating environmental conditions.

NOTE: Some E880 and E880C systems may include a mix of 40-core and 48-core LPARs.

Section 2b – AIX Multi-user Performance (POWER9) in Non-default Processor Power Mode Setting

All 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*	Inst/Data	Cache	LPAR Size# cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	L2/L3 (MB)/ System					
S914	p9/4	2.3 – 3.8	64/64	2/40	4	32.3	54.9	75.7	95.4
S914	p9/6	2.3 – 3.8	64/64	3/60	6	47.3	80.4	110.9	139.8
S914	p9/8	2.8 – 3.8	64/64	4/80	8	68.3	116.1	160.2	201.8

NOTE: POWER9 frequency is expressed as a range from Typical GHz to Max GHz.

NOTE: The performance numbers shown here are for S914 with its Power Management mode set to non-default Max Performance. This mode dynamically optimizes the processor frequency at any given time based on CPU utilization and operating environmental conditions. Running S914 systems in the non-default power mode of Max Performance mode may cause measurably higher sound levels under high utilization.

Section 2c – AIX Multi-user Performance (POWER7 and POWER7+)

Performance results in this table 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	Ins/Data		LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	Cache L2/L3 (MB)/ System					
PS700	P7/4	3.00	32/32	1/16	4	--	--	45.13	--
PS701	P7/8	3.00	32/32	2/32	8	--	--	81.24	--
PS702	P7/16	3.00	32/32	4/64	16	--	--	154.36	--
PS703	P7/16	2.40	32/32	4/64	16	--	--	134.11	--
PS704	P7/32	2.40	32/32	8/128	32	--	--	251.45	--
PFlex260	P7/8 (2x4c)	3.30	32/32	2/32	8	--	--	92.80	--
PFlex260	P7/16	3.22	32/32	4/64	16	--	--	163.80	--
PFlex260	P7/16	3.55	32/32	4/64	16	--	--	176.60	--
PFlex260	P7+/4 (2x2c)	4.08	32/32	1/40	4	--	--	61.20	--
PFlex260	P7+/8 (2x4c)	4.08	32/32	2/80	8	--	--	115.50	--
PFlex260	P7+/16	3.61	32/32	4/160	16	--	--	197.70	--
PFlex260	P7+/16	4.11	32/32	4/160	16	--	--	218.50	--
PFlex270	P7+/24	3.13	32/32	6/240	24	--	--	251.60	--
PFlex270	P7+/24	3.41	32/32	6/240	24	--	--	268.00	--
PFlex460	P7/16 (4x4c)	3.30	32/32	4/64	16	--	--	174.00	--
PFlex460	P7/32	3.22	32/32	8/128	32	--	--	307.00	--
PFlex460	P7/32	3.55	32/32	8/128	32	--	--	331.10	--
PFlex460	P7+/16 (4x4c)	4.08	32/32	4/160	16	--	--	225.00	--
PFlex460	P7+/32	3.61	32/32	8/320	32	--	--	372.60	--
PFlex460	P7+/32	4.11	32/32	8/320	32	--	--	411.70	--
710	P7/4	3.00	32/32	1/16	4	--	--	45.13	--
710	P7/4	3.70	32/32	1/16	4	--	--	52.93	--
710	P7/6	3.70	32/32	1.5/24	6	--	--	76.69	--
710	P7/8	3.55	32/32	2/32	8	--	--	91.96	--
710	P7+/4	3.60	32/32	1/40	4	--	--	53.90	--
710	P7+/6	4.20	32/32	1.5/60	6	--	--	90.60	--
710	P7+/8	4.20	32/32	2/80	8	--	--	115.50	--
720	P7/4	3.00	32/32	1/16	4	--	--	45.13	--
720	P7/6	3.00	32/32	1.5/24	6	--	--	65.52	--
720	P7/8	3.00	32/32	2/32	8	--	--	81.24	--
720	P7+/4	3.60	32/32	1/40	4	--	--	53.90	--
720	P7+/6	3.60	32/32	1.5/60	6	--	--	79.50	--
720	P7+/8	3.60	32/32	2/80	8	--	--	102.40	--
730	P7/8	3.00	32/32	2/32	8	--	--	86.66	--
730	P7/8	3.70	32/32	2/32	8	--	--	101.62	--
730	P7/12	3.70	32/32	3/48	12	--	--	147.24	--
730	P7/16	3.55	32/32	4/64	16	--	--	176.57	--
730	P7+/4	4.30	32/32	1/40	4	--	--	61.70	--
730	P7+/8	4.30	32/32	2/80	8	--	--	120.40	--
730	P7+/6	4.20	32/32	1.5/60	6	--	--	90.60	--
730	P7+/12	4.20	32/32	3/120	12	--	--	176.60	--
730	P7+/8	3.60	32/32	2/80	8	--	--	102.40	--
730	P7+/16	3.60	32/32	4/160	16	--	--	197.70	--
730	P7+/8	4.20	32/32	2/80	8	--	--	115.50	--
730	P7+/16	4.20	32/32	4/160	16	--	--	223.10	--
740	P7/4	3.30	32/32	1/16	4	--	--	48.33	--
740	P7/4	3.70	32/32	1/16	4	--	--	52.93	--
740	P7/6	3.70	32/32	1.5/24	6	--	--	76.69	--
740	P7/8	3.30	32/32	2/32	8	--	--	92.79	--

Model	Processor / # Cores	Freq. GHz	Ins/Data		LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	Cache L2/L3 (MB)/ System					
740	P7/8	3.55	32/32	2/32	8	--	--	91.96	--
740	P7/8	3.70	32/32	2/32	8	--	--	101.62	--
740	P7/12	3.70	32/32	3/48	12	--	--	147.24	--
740	P7/16	3.55	32/32	4/64	16	--	--	176.57	--
740	P7+/6	4.20	32/32	1.5/60	6	--	--	90.60	--
740	P7+/12	4.20	32/32	3/120	12	--	--	176.60	--
740	P7+/8	3.60	32/32	2/80	8	--	--	102.40	--
740	P7+/16	3.60	32/32	4/160	16	--	--	197.70	--
740	P7+/8	4.20	32/32	2/80	8	--	--	115.50	--
740	P7+/16	4.20	32/32	4/160	16	--	--	223.10	--
750	P7/6	3.30	32/32	1.5/24	6	--	--	70.07	--
750	P7/12	3.30	32/32	3/48	12	--	--	134.54	--
750	P7/18	3.30	32/32	4.5/72	18	--	--	193.40	--
750	P7/24	3.30	32/32	6/96	24	--	--	252.26	--
750	P7/8	3.00	32/32	2/32	8	--	--	81.24	--
750	P7/16	3.00	32/32	4/64	16	--	--	155.99	--
750	P7/24	3.00	32/32	6/96	24	--	--	224.23	--
750	P7/32	3.00	32/32	8/128	32	--	--	292.47	--
750	P7/8	3.30	32/32	2/32	8	--	--	86.99	--
750	P7/16	3.30	32/32	4/64	16	--	--	167.01	--
750	P7/24	3.30	32/32	6/96	24	--	--	240.08	--
750	P7/32	3.30	32/32	8/128	32	--	--	313.15	--
750	P7/8	3.55	32/32	2/32	8	--	--	91.96	--
750	P7/16	3.55	32/32	4/64	16	--	--	176.57	--
750	P7/24	3.55	32/32	6/96	24	--	--	253.82	--
750	P7/32	3.55	32/32	8/128	32	--	--	331.06	--
750	P7/8	3.20	32/32	2/32	8	--	--	85.29	--
750	P7/16	3.20	32/32	4/64	16	--	--	163.75	--
750	P7/24	3.20	32/32	6/96	24	--	--	235.39	--
750	P7/32	3.20	32/32	8/128	32	--	--	307.03	--
750	P7/8	3.60	32/32	2/32	8	--	--	93.05	--
750	P7/16	3.60	32/32	4/64	16	--	--	178.65	--
750	P7/24	3.60	32/32	6/96	24	--	--	256.81	--
750	P7/32	3.60	32/32	8/128	32	--	--	334.97	--
750	P7/4	3.70	32/32	1/16	4	--	--	52.90	--
750	P7/8	3.70	32/32	2/32	8	--	--	101.57	--
750	P7/12(3x4c)	3.70	32/32	3/48	12	--	--	146.00	--
750	P7/16	3.70	32/32	4/64	16	--	--	190.44	--
750	P7/6	3.70	32/32	1.5/24	6	--	--	76.71	--
750	P7/12(2x6c)	3.70	32/32	3/48	12	--	--	147.27	--
750	P7/18	3.70	32/32	4.5/72	18	--	--	211.71	--
750	P7/24	3.70	32/32	6/96	24	--	--	276.14	--
750	P7+/8	3.50	32/32	2/80	8	--	--	104.50	--
750	P7+/16	3.50	32/32	4/160	16	--	--	197.00	--
750	P7+/24	3.50	32/32	6/240	24	--	--	275.90	--
750	P7+/32	3.50	32/32	8/320	32	--	--	354.90	--
750	P7+/8	4.00	32/32	2/80	8	--	--	117.10	--
750	P7+/16	4.00	32/32	4/160	16	--	--	220.70	--
750	P7+/24	4.00	32/32	6/240	24	--	--	309.20	--
750	P7+/32	4.00	32/32	8/320	32	--	--	397.70	--
760	P7+/12	3.10	32/32	3/120	12	--	--	142.10	--
760	P7+/24	3.10	32/32	6/240	24	--	--	264.80	--
760	P7+/36	3.10	32/32	9/360	36	--	--	370.70	--
760	P7+/48	3.10	32/32	12/480	48	--	--	476.70	--
760	P7+/12	3.40	32/32	3/120	12	--	--	151.40	--
760	P7+/24	3.40	32/32	6/240	24	--	--	282.10	--

Model	Processor / # Cores	Freq. GHz	Ins/Data		LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	Cache L2/L3 (MB)/ System					
760	P7+/36	3.40	32/32	9/360	36	--	--	395.00	--
760	P7+/48	3.40	32/32	12/480	48	--	--	507.80	--
770	P7/6	3.50	32/32	1.5/24	6	--	--	72.55	--
770	P7/12	3.50	32/32	3/48	12	--	--	140.75	--
770	P7/24	3.50	32/32	6/96	24	--	--	261.19	--
770	P7/36	3.50	32/32	9/144	36	--	--	377.28	--
770	P7/48	3.50	32/32	12/192	48	--	--	493.37	--
770	P7/6	3.70	32/32	1.5/24	6	--	--	76.00	--
770	P7/12	3.70	32/32	3/48	12	--	--	147.50	--
770	P7/24	3.70	32/32	6/96	24	--	--	273.70	--
770	P7/36	3.70	32/32	9/144	36	--	--	395.40	--
770	P7/48	3.70	32/32	12/192	48	--	--	517.00	--
770	P7/8	3.10	32/32	2/32	8	--	--	85.20	--
770	P7/16	3.10	32/32	4/64	16	--	--	165.30	--
770	P7/32	3.10	32/32	8/128	32	--	--	306.74	--
770	P7/48	3.10	32/32	12/192	48	--	--	443.06	--
770	P7/64	3.10	32/32	16/256	64	--	--	579.39	--
770	P7/8	3.30	32/32	2/32	8	--	--	89.20	--
770	P7/16	3.30	32/32	4/64	16	--	--	173.10	--
770	P7/32	3.30	32/32	8/128	32	--	--	321.20	--
770	P7/48	3.30	32/32	12/192	48	--	--	464.00	--
770	P7/64	3.30	32/32	16/256	64	--	--	606.80	--
770	P7+/6	4.22	32/32	1.5/60	6	--	--	94.50	--
770	P7+/12	4.22	32/32	3/120	12	--	--	184.20	--
770	P7+/24	4.22	32/32	6/240	24	--	--	345.10	--
770	P7+/36	4.22	32/32	9/360	36	--	--	478.90	--
770	P7+/48	4.22	32/32	12/480	48	--	--	612.70	--
770	P7+/8	3.80	32/32	2/80	8	--	--	112.50	--
770	P7+/16	3.80	32/32	4/160	16	--	--	219.30	--
770	P7+/32	3.80	32/32	8/320	32	--	--	410.80	--
770	P7+/48	3.80	32/32	12/480	48	--	--	570.10	--
770	P7+/64	3.80	32/32	16/640	64	--	--	729.30	--
780	P7/8	3.86	32/32	2/32	8	--	--	100.75	--
780	P7/16	3.86	32/32	4/64	16	--	--	195.45	--
780	P7/32	3.86	32/32	8/128	32	--	--	362.70	--
780	P7/48	3.86	32/32	12/192	48	--	--	523.89	--
780	P7/64	3.86	32/32	16/256	64	--	--	685.09	--
780	P7/8	3.92	32/32	2/32	8	--	--	101.80	--
780	P7/16	3.92	32/32	4/64	16	--	--	197.60	--
780	P7/32	3.92	32/32	8/128	32	--	--	366.60	--
780	P7/48	3.92	32/32	12/192	48	--	--	529.60	--
780	P7/64	3.92	32/32	16/256	64	--	--	692.50	--
780	P7/8	4.14	32/32	4/64	8	--	--	115.86	--
780	P7/16	4.14	32/32	8/128	16	--	--	226.97	--
780	P7/24	4.14	32/32	12/192	24	--	--	326.24	--
780	P7/32	4.14	32/32	16/256	32	--	--	425.50	--
780	P7/12	3.44	32/32	3/48	12	--	--	138.40	--
780	P7/24	3.44	32/32	6/96	24	--	--	253.30	--
780	P7/48	3.44	32/32	12/192	48	--	--	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	8	--	--	126.10	--
780	P7+/16	4.42	32/32	4/160	16	--	--	245.70	--
780	P7+/32	4.42	32/32	8/320	32	--	--	460.30	--
780	P7+/48	4.42	32/32	12/480	48	--	--	638.70	--
780	P7+/64	4.42	32/32	16/640	64	--	--	817.10	--

Model	Processor / # Cores	Freq. GHz	Ins/Data		LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Cache L1 (KB) Per core	Cache L2/L3 (MB)/ System					
780	P7+/16	3.72	32/32	4/160	16	--	--	207.00	--
780	P7+/32	3.72	32/32	8/320	32	--	--	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	--
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: Up to 5% additional rPerf may be realized for POWER7 systems with Intelligent Energy Optimization enabled depending on the system.

Section 2d – AIX Capacity Upgrade on Demand Relative Performance Guidelines (POWER8 and POWER9)

All 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		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
E870	p8/8	4.02	8		82.8	120.1	156.2	167.1
E870	p8/12	4.02	12		122.2	177.2	230.3	246.4
E870	p8/16	4.02	16		161.6	234.3	304.5	325.8
E870	p8/20	4.02	20		199.9	289.9	376.9	403.3
E870	p8/24	4.02	24		238.3	345.5	449.1	480.6
E870	p8/28	4.02	28		276.7	401.2	521.5	558.0
E870	p8/32	4.02	32		315.0	456.8	593.8	635.4
E870C	p8/8	4.02	8		82.8	120.1	156.2	167.1
E870C	p8/12	4.02	12		122.2	177.2	230.3	246.4
E870C	p8/16	4.02	16		161.6	234.3	304.5	325.8
E870C	p8/20	4.02	20		199.9	289.9	376.9	403.3

Model	Processor / # Cores	Freq. GHz	LPAR		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
E870C	p8/24	4.02	24		238.3	345.5	449.1	480.6
E870C	p8/28	4.02	28		276.7	401.2	521.5	558.0
E870C	p8/32	4.02	32		315.0	456.8	593.8	635.4
E870	p8/8	4.19	8		85.2	123.5	160.5	171.8
E870	p8/12	4.19	12		125.1	181.4	235.9	252.4
E870	p8/16	4.19	16		165.0	239.4	311.1	332.9
E870	p8/20	4.19	20		205.0	297.3	386.4	413.5
E870	p8/24	4.19	24		244.0	353.7	459.9	492.1
E870	p8/28	4.19	28		282.9	410.2	533.3	570.7
E870	p8/32	4.19	32		321.9	466.7	606.7	649.2
E870	p8/36	4.19	36		360.8	523.2	680.1	727.8
E870	p8/40	4.19	40		399.8	579.7	753.6	806.4
E880	p8/8	4.35	8		88.0	127.5	165.8	177.5
E880	p8/12	4.35	12		129.8	188.1	244.6	261.7
E880	p8/16	4.35	16		171.5	248.8	323.4	346.0
E880	p8/20	4.35	20		212.3	307.8	400.2	428.1
E880	p8/24	4.35	24		253.0	366.9	476.9	510.4
E880	p8/28	4.35	28		293.8	426.0	553.8	592.5
E880	p8/32	4.35	32		334.5	485.0	630.6	674.8
E880C	p8/8	4.35	8		88.0	127.5	165.8	177.5
E880C	p8/12	4.35	12		129.8	188.1	244.6	261.7
E880C	p8/16	4.35	16		171.5	248.8	323.4	346.0
E880C	p8/20	4.35	20		212.3	307.8	400.2	428.1
E880C	p8/24	4.35	24		253.0	366.9	476.9	510.4
E880C	p8/28	4.35	28		293.8	426.0	553.8	592.5
E880C	p8/32	4.35	32		334.5	485.0	630.6	674.8
E880	p8/8	4.19	8		85.2	123.5	160.5	171.8
E880	p8/12	4.19	12		125.1	181.4	235.9	252.4
E880	p8/16	4.19	16		165.0	239.4	311.1	332.9
E880	p8/20	4.19	20		205.0	297.3	386.4	413.5
E880	p8/24	4.19	24		244.0	353.7	459.9	492.1
E880	p8/28	4.19	28		282.9	410.2	533.3	570.7
E880	p8/32	4.19	32		321.9	466.7	606.7	649.2
E880	p8/36	4.19	36		360.8	523.2	680.1	727.8
E880	p8/40	4.19	40		399.8	579.7	753.6	806.4
E880C	p8/8	4.19	8		85.2	123.5	160.5	171.8
E880C	p8/12	4.19	12		125.1	181.4	235.9	252.4
E880C	p8/16	4.19	16		165.0	239.4	311.1	332.9
E880C	p8/20	4.19	20		205.0	297.3	386.4	413.5
E880C	p8/24	4.19	24		244.0	353.7	459.9	492.1
E880C	p8/28	4.19	28		282.9	410.2	533.3	570.7
E880C	p8/32	4.19	32		321.9	466.7	606.7	649.2
E880C	p8/36	4.19	36		360.8	523.2	680.1	727.8
E880C	p8/40	4.19	40		399.8	579.7	753.6	806.4
E880	p8/8	4.00	8		82.5	119.6	155.5	166.4
E880	p8/12	4.00	12		119.9	173.9	226.1	241.9
E880	p8/16	4.00	16		157.9	229.0	297.7	318.5
E880	p8/20	4.00	20		195.9	284.0	369.3	395.1
E880	p8/24	4.00	24		233.9	339.1	440.9	471.7
E880	p8/28	4.00	28		270.9	392.8	510.7	546.4
E880	p8/32	4.00	32		307.9	446.5	580.5	621.1

Model	Processor / # Cores	Freq. GHz	LPAR		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
E880	p8/36	4.00	36		345.0	500.2	650.3	695.8
E880	p8/40	4.00	40		382.0	553.9	720.1	770.5
E880	p8/44	4.00	44		419.0	607.6	789.9	845.2
E880	p8/48	4.00	48		456.0	661.3	859.7	919.8
E880C	p8/8	4.00	8		82.5	119.6	155.5	166.4
E880C	p8/12	4.00	12		119.9	173.9	226.1	241.9
E880C	p8/16	4.00	16		157.9	229.0	297.7	318.5
E880C	p8/20	4.00	20		195.9	284.0	369.3	395.1
E880C	p8/24	4.00	24		233.9	339.1	440.9	471.7
E880C	p8/28	4.00	28		270.9	392.8	510.7	546.4
E880C	p8/32	4.00	32		307.9	446.5	580.5	621.1
E880C	p8/36	4.00	36		345.0	500.2	650.3	695.8
E880C	p8/40	4.00	40		382.0	553.9	720.1	770.5
E880C	p8/44	4.00	44		419.0	607.6	789.9	845.2
E880C	p8/48	4.00	48		456.0	661.3	859.7	919.8
E980	p9/8	3.9 – 4.0	8		80.9	137.5	189.8	239.1
E980	p9/12	3.9 – 4.0	12		118.1	200.7	277.0	349.1
E980	p9/16	3.9 – 4.0	16		161.7	274.8	379.3	477.9
E980	p9/20	3.9 – 4.0	20		196.0	333.1	459.7	579.3
E980	p9/24	3.9 – 4.0	24		230.3	391.5	540.2	680.7
E980	p9/28	3.9 – 4.0	28		268.9	457.2	630.9	795.0
E980	p9/32	3.9 – 4.0	32		307.8	523.3	722.2	910.0
E980	p9/8	3.7 – 3.9	8		79.2	134.6	185.7	234.0
E980	p9/12	3.7 – 3.9	12		115.6	196.4	271.1	341.6
E980	p9/16	3.7 – 3.9	16		158.2	269.0	371.2	467.7
E980	p9/20	3.7 – 3.9	20		191.8	326.0	449.9	566.9
E980	p9/24	3.7 – 3.9	24		225.3	383.1	528.6	666.1
E980	p9/28	3.7 – 3.9	28		263.2	447.4	617.4	778.0
E980	p9/32	3.7 – 3.9	32		301.0	511.8	706.2	889.8
E980	p9/36	3.7 – 3.9	36		332.3	565.0	779.7	982.4
E980	p9/40	3.7 – 3.9	40		371.5	631.5	871.5	1,098.1
E980	p9/8	3.58 – 3.9	8		78.0	132.6	183.1	230.6
E980	p9/12	3.58 – 3.9	12		113.9	193.6	267.2	336.7
E980	p9/16	3.58 – 3.9	16		156.0	265.1	365.9	461.0
E980	p9/20	3.58 – 3.9	20		189.0	321.4	443.5	558.8
E980	p9/24	3.58 – 3.9	24		222.1	377.6	521.1	656.6
E980	p9/28	3.58 – 3.9	28		259.4	441.0	608.6	766.9
E980	p9/32	3.58 – 3.9	32		296.7	504.5	696.2	877.2
E980	p9/36	3.58 – 3.9	36		327.6	556.9	768.6	968.4
E980	p9/40	3.58 – 3.9	40		366.1	622.3	858.8	1,082.0
E980	p9/44	3.58 – 3.9	44		399.7	679.5	937.7	1,181.4
E980	p9/8	3.55 – 3.9	8		77.4	131.6	181.6	228.8
E980	p9/12	3.55 – 3.9	12		113.0	192.1	265.1	334.0
E980	p9/16	3.55 – 3.9	16		154.7	263.0	362.9	457.3
E980	p9/20	3.55 – 3.9	20		187.5	318.8	439.9	554.3
E980	p9/24	3.55 – 3.9	24		220.3	374.6	516.9	651.3
E980	p9/28	3.55 – 3.9	28		257.3	437.5	603.7	760.7
E980	p9/32	3.55 – 3.9	32		294.3	500.4	690.5	870.1
E980	p9/36	3.55 – 3.9	36		325.0	552.4	762.4	960.6
E980	p9/40	3.55 – 3.9	40		363.1	617.3	851.8	1,073.3
E980	p9/44	3.55 – 3.9	44		396.4	673.9	930.0	1,171.7
E980	p9/48	3.55 – 3.9	48		429.7	730.5	1,008.1	1,270.2

Model	Processor / # Cores	Freq. GHz	LPAR		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					

NOTE: Up to 5% additional rPerf may be realized for POWER8 systems with Intelligent Energy Optimization enabled depending on the system.

NOTE: POWER9 frequency is expressed as a range from Typical GHz to Max GHz.

NOTE: E980 systems by default will have its Power Management mode set to Max Performance. This mode dynamically optimizes the processor frequency at any given time based on CPU utilization and operating environmental conditions.

Section 2e – AIX Capacity Upgrade on Demand Relative Performance Guidelines (POWER7 and POWER7+)

Performance results in this table 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		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
770	P7/4	3.50	4		--	--	49.19	--
770	P7/6	3.50	6		--	--	72.55	--
770	P7/8	3.50	8		--	--	95.29	--
770	P7/12	3.50	12		--	--	140.75	--
770	P7/16	3.50	16		--	--	180.90	--
770	P7/20	3.50	20		--	--	221.05	--
770	P7/24	3.50	24		--	--	261.19	--
770	P7/28	3.50	28		--	--	299.89	--
770	P7/32	3.50	32		--	--	338.58	--
770	P7/36	3.50	36		--	--	377.28	--
770	P7/40	3.50	40		--	--	415.97	--
770	P7/44	3.50	44		--	--	454.67	--
770	P7/48	3.50	48		--	--	493.37	--
770	P7/4	3.70	4		--	--	51.60	--
770	P7/6	3.70	6		--	--	76.00	--
770	P7/8	3.70	8		--	--	99.90	--
770	P7/12	3.70	12		--	--	147.50	--
770	P7/16	3.70	16		--	--	189.60	--
770	P7/20	3.70	20		--	--	231.70	--
770	P7/24	3.70	24		--	--	273.70	--
770	P7/28	3.70	28		--	--	314.30	--
770	P7/32	3.70	32		--	--	354.80	--
770	P7/36	3.70	36		--	--	395.40	--
770	P7/40	3.70	40		--	--	435.90	--
770	P7/44	3.70	44		--	--	476.50	--
770	P7/48	3.70	48		--	--	517.00	--
770	P7/4	3.10	4		--	--	44.84	--
770	P7/8	3.10	8		--	--	85.20	--
770	P7/12	3.10	12		--	--	125.25	--
770	P7/16	3.10	16		--	--	165.30	--
770	P7/20	3.10	20		--	--	200.66	--
770	P7/24	3.10	24		--	--	236.02	--
770	P7/28	3.10	28		--	--	271.38	--
770	P7/32	3.10	32		--	--	306.74	--
770	P7/36	3.10	36		--	--	340.82	--
770	P7/40	3.10	40		--	--	374.90	--
770	P7/44	3.10	44		--	--	408.98	--
770	P7/48	3.10	48		--	--	443.06	--
770	P7/52	3.10	52		--	--	477.15	--
770	P7/56	3.10	56		--	--	511.23	--
770	P7/60	3.10	60		--	--	545.31	--

Model	Processor / # Cores	Freq. GHz	LPAR Size #cores	rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
770	P7/64	3.10	64	--	--	579.39	--
770	P7/4	3.30	4	--	--	47.00	--
770	P7/8	3.30	8	--	--	89.20	--
770	P7/12	3.30	12	--	--	131.20	--
770	P7/16	3.30	16	--	--	173.10	--
770	P7/20	3.30	20	--	--	210.10	--
770	P7/24	3.30	24	--	--	247.20	--
770	P7/28	3.30	28	--	--	284.20	--
770	P7/32	3.30	32	--	--	321.20	--
770	P7/36	3.30	36	--	--	356.90	--
770	P7/40	3.30	40	--	--	392.60	--
770	P7/44	3.30	44	--	--	428.30	--
770	P7/48	3.30	48	--	--	464.00	--
770	P7/52	3.30	52	--	--	499.70	--
770	P7/56	3.30	56	--	--	535.40	--
770	P7/60	3.30	60	--	--	571.10	--
770	P7/64	3.30	64	--	--	606.80	--
770	P7+/4	4.22	4	--	--	64.10	--
770	P7+/6	4.22	6	--	--	94.50	--
770	P7+/8	4.22	8	--	--	124.40	--
770	P7+/12	4.22	12	--	--	184.20	--
770	P7+/16	4.22	16	--	--	237.80	--
770	P7+/20	4.22	20	--	--	291.50	--
770	P7+/24	4.22	24	--	--	345.10	--
770	P7+/28	4.22	28	--	--	389.70	--
770	P7+/32	4.22	32	--	--	434.30	--
770	P7+/36	4.22	36	--	--	478.90	--
770	P7+/40	4.22	40	--	--	523.50	--
770	P7+/44	4.22	44	--	--	568.10	--
770	P7+/48	4.22	48	--	--	612.70	--
770	P7+/4	3.80	4	--	--	59.20	--
770	P7+/8	3.80	8	--	--	112.50	--
770	P7+/12	3.80	12	--	--	165.90	--
770	P7+/16	3.80	16	--	--	219.30	--
770	P7+/20	3.80	20	--	--	267.10	--
770	P7+/24	3.80	24	--	--	315.00	--
770	P7+/28	3.80	28	--	--	362.90	--
770	P7+/32	3.80	32	--	--	410.80	--
770	P7+/36	3.80	36	--	--	450.60	--
770	P7+/40	3.80	40	--	--	490.40	--
770	P7+/44	3.80	44	--	--	530.30	--
770	P7+/48	3.80	48	--	--	570.10	--
770	P7+/52	3.80	52	--	--	609.90	--
770	P7+/56	3.80	56	--	--	649.70	--
770	P7+/60	3.80	60	--	--	689.50	--
770	P7+/64	3.80	64	--	--	729.30	--
780	P7/4	3.86	4	--	--	53.03	--
780	P7/8	3.86	8	--	--	100.75	--
780	P7/12	3.86	12	--	--	148.10	--
780	P7/16	3.86	16	--	--	195.45	--
780	P7/20	3.86	20	--	--	237.26	--
780	P7/24	3.86	24	--	--	279.07	--
780	P7/28	3.86	28	--	--	320.88	--

Model	Processor / # Cores	Freq. GHz	LPAR		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
780	P7/32	3.86	32		--	--	362.70	--
780	P7/36	3.86	36		--	--	403.00	--
780	P7/40	3.86	40		--	--	443.29	--
780	P7/44	3.86	44		--	--	483.59	--
780	P7/48	3.86	48		--	--	523.89	--
780	P7/52	3.86	52		--	--	564.19	--
780	P7/56	3.86	56		--	--	604.49	--
780	P7/60	3.86	60		--	--	644.79	--
780	P7/64	3.86	64		--	--	685.09	--
780	P7/4	3.92	4		--	--	53.60	--
780	P7/8	3.92	8		--	--	101.80	--
780	P7/12	3.92	12		--	--	149.70	--
780	P7/16	3.92	16		--	--	197.60	--
780	P7/20	3.92	20		--	--	239.80	--
780	P7/24	3.92	24		--	--	282.10	--
780	P7/28	3.92	28		--	--	324.40	--
780	P7/32	3.92	32		--	--	366.60	--
780	P7/36	3.92	36		--	--	407.40	--
780	P7/40	3.92	40		--	--	448.10	--
780	P7/44	3.92	44		--	--	488.90	--
780	P7/48	3.92	48		--	--	529.60	--
780	P7/52	3.92	52		--	--	570.30	--
780	P7/56	3.92	56		--	--	611.10	--
780	P7/60	3.92	60		--	--	651.80	--
780	P7/64	3.92	64		--	--	692.50	--
780	P7/4	4.14	4		--	--	59.26	--
780	P7/8	4.14	8		--	--	115.86	--
780	P7/12	4.14	12		--	--	171.42	--
780	P7/16	4.14	16		--	--	226.97	--
780	P7/20	4.14	20		--	--	276.61	--
780	P7/24	4.14	24		--	--	326.24	--
780	P7/28	4.14	28		--	--	375.87	--
780	P7/32	4.14	32		--	--	425.50	--
780	P7/4	3.44	4		--	--	48.60	--
780	P7/6	3.44	6		--	--	71.70	--
780	P7/8	3.44	8		--	--	93.90	--
780	P7/12	3.44	12		--	--	138.40	--
780	P7/16	3.44	16		--	--	176.70	--
780	P7/20	3.44	20		--	--	215.00	--
780	P7/24	3.44	24		--	--	253.30	--
780	P7/28	3.44	28		--	--	285.00	--
780	P7/32	3.44	32		--	--	316.60	--
780	P7/36	3.44	36		--	--	348.30	--
780	P7/40	3.44	40		--	--	380.00	--
780	P7/44	3.44	44		--	--	411.60	--
780	P7/48	3.44	48		--	--	443.30	--
780	P7+/4	4.42	4		--	--	66.30	--
780	P7+/8	4.42	8		--	--	126.10	--
780	P7+/12	4.42	12		--	--	185.90	--
780	P7+/16	4.42	16		--	--	245.70	--
780	P7+/20	4.42	20		--	--	299.30	--
780	P7+/24	4.42	24		--	--	353.00	--
780	P7+/28	4.42	28		--	--	406.60	--

Model	Processor / # Cores	Freq. GHz	LPAR		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
780	P7+/32	4.42	32		--	--	460.30	--
780	P7+/36	4.42	36		--	--	504.90	--
780	P7+/40	4.42	40		--	--	549.50	--
780	P7+/44	4.42	44		--	--	594.10	--
780	P7+/48	4.42	48		--	--	638.70	--
780	P7+/52	4.42	52		--	--	683.30	--
780	P7+/56	4.42	56		--	--	727.90	--
780	P7+/60	4.42	60		--	--	772.50	--
780	P7+/64	4.42	64		--	--	817.10	--
780	P7+/4	3.72	4		--	--	56.80	--
780	P7+/8	3.72	8		--	--	107.80	--
780	P7+/12	3.72	12		--	--	157.40	--
780	P7+/16	3.72	16		--	--	207.00	--
780	P7+/20	3.72	20		--	--	251.20	--
780	P7+/24	3.72	24		--	--	295.40	--
780	P7+/28	3.72	28		--	--	339.70	--
780	P7+/32	3.72	32		--	--	383.90	--
780	P7+/36	3.72	36		--	--	422.10	--
780	P7+/40	3.72	40		--	--	460.40	--
780	P7+/44	3.72	44		--	--	498.70	--
780	P7+/48	3.72	48		--	--	537.00	--
780	P7+/52	3.72	52		--	--	575.30	--
780	P7+/56	3.72	56		--	--	613.50	--
780	P7+/60	3.72	60		--	--	651.80	--
780	P7+/64	3.72	64		--	--	690.10	--
795	P7/6	3.70	6		--	--	75.97	--
795	P7/8	3.70	8		--	--	99.78	--
795	P7/12	3.70	12		--	--	147.39	--
795	P7/16	3.70	16		--	--	189.43	--
795	P7/20	3.70	20		--	--	231.47	--
795	P7/24	3.70	24		--	--	273.51	--
795	P7/28	3.70	28		--	--	314.03	--
795	P7/32	3.70	32		--	--	354.55	--
795	P7/36	3.70	36		--	--	395.07	--
795	P7/40	3.70	40		--	--	435.58	--
795	P7/44	3.70	44		--	--	476.10	--
795	P7/48	3.70	48		--	--	516.62	--
795	P7/52	3.70	52		--	--	548.91	--
795	P7/56	3.70	56		--	--	581.20	--
795	P7/60	3.70	60		--	--	613.49	--
795	P7/64	3.70	64		--	--	645.78	--
795	P7/8	4.00	8		--	--	103.41	--
795	P7/12	4.00	12		--	--	152.01	--
795	P7/16	4.00	16		--	--	200.61	--
795	P7/20	4.00	20		--	--	243.53	--
795	P7/24	4.00	24		--	--	286.44	--
795	P7/28	4.00	28		--	--	329.36	--
795	P7/32	4.00	32		--	--	372.27	--
795	P7/36	4.00	36		--	--	413.63	--
795	P7/40	4.00	40		--	--	455.00	--
795	P7/44	4.00	44		--	--	496.36	--
795	P7/48	4.00	48		--	--	537.72	--
795	P7/52	4.00	52		--	--	579.09	--
795	P7/56	4.00	56		--	--	620.45	--

Model	Processor / # Cores	Freq. GHz	LPAR		rPerf ST	rPerf SMT2	rPerf SMT4	rPerf SMT8
			Size #cores					
795	P7/60	4.00	60		--	--	661.81	--
795	P7/64	4.00	64		--	--	703.18	--
795	P7/4	4.25	4		--	--	60.46	--
795	P7/8	4.25	8		--	--	118.21	--
795	P7/12	4.25	12		--	--	174.89	--
795	P7/16	4.25	16		--	--	231.57	--
795	P7/20	4.25	20		--	--	282.21	--
795	P7/24	4.25	24		--	--	332.85	--
795	P7/28	4.25	28		--	--	383.49	--
795	P7/32	4.25	32		--	--	434.13	--
795	P7/36	4.25	36		--	--	477.00	--
795	P7/40	4.25	40		--	--	519.87	--
795	P7/44	4.25	44		--	--	562.74	--
795	P7/48	4.25	48		--	--	605.61	--
795	P7/52	4.25	52		--	--	648.48	--
795	P7/56	4.25	56		--	--	691.35	--
795	P7/60	4.25	60		--	--	734.22	--
795	P7/64	4.25	64		--	--	777.09	--

NOTE: Up to 5% additional rPerf may be realized for POWER7 systems with Intelligent Energy Optimization enabled depending on the system.

Section 3 – CPW Benchmark Performance

Section 3a – CPW Benchmark Performance (POWER8 and POWER9)

All 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	LPAR size		CPW
			#cores		
S812	1	3.02	1		9,360
S822	2	3.42	2		21,800
S822	2	3.89	2		24,170
S822	2	4.15	2		25,600
S822	4	3.42	4		42,470
S822	4	3.89	4		45,220
S822	4	4.15	4		49,960
S922	4	3.4 – 3.9	4		68,000 ¹
S922	4	2.9 – 3.8	4		60,000 ¹
S814	4	3.02	4		37,440
S814	6	3.02	6		56,400
S814	8	3.72	8		81,050
S914	4	2.3 – 3.8	4		52,500 ¹
S914	6	2.3 – 3.8	6		78,500 ¹
S914	8	2.8 – 3.8	8		122,500 ¹
S824	6	3.89	6		68,250
S824	12	3.89	12		123,240
S824	8	4.15	8		89,580
S824	16	4.15	16		164,470
S824	24	3.52	24		218,510

S924	8	3.8 – 4.0	8	145,500 ¹
S924	16	3.8 – 4.0	16	268,500 ¹
S924	10	3.5 – 3.9	10	174,500 ¹
S924	20	3.5 – 3.9	20	318,000 ¹
S924	24	3.4 – 3.9	24	370,700 ¹
E870	32	4.02	32	340,330
E870	64	4.02	32	674,020
E870	40	4.19	40	436,080
E870	80	4.19	40	863,620
E870C	32	4.02	32	340,330
E870C	64	4.02	32	674,020
E880	40	4.02	40	409,500
E880	80	4.02	40	817,400
E880	120	4.02	40	1,226,100
E880	40	4.19	40	436,080
E880	80	4.19	40	863,620
E880	120	4.19	40	1,291,170
E880	160	4.19	40	1,718,720
E880	32	4.35	32	361,180
E880	64	4.35	32	715,740
E880	96	4.35	32	1,084,510
E880	128	4.35	32	1,443,800
E880	48	4.02	48	491,060
E880	96	4.02	48	980,230
E880	144	4.02	48	1,470,340
E880	192	4.02	48	1,961,410
E880C	32	4.35	32	361,180
E880C	64	4.35	32	715,740
E880C	96	4.35	32	1,084,510
E880C	128	4.35	32	1,443,800
E880C	40	4.02	40	409,500
E880C	80	4.02	40	817,400
E880C	120	4.02	40	1,226,100
E880C	40	4.19	40	436,080
E880C	80	4.19	40	863,620
E880C	120	4.19	40	1,291,170
E880C	160	4.19	40	1,718,720
E880C	48	4.02	48	491,060
E880C	96	4.02	48	980,230
E880C	144	4.02	48	1,470,340
E880C	192	4.02	48	1,961,410
E980	32	3.9 – 4.0	32	508,900
E980	64	3.9 – 4.0	32	1,012,000
E980	96	3.9 – 4.0	32	1,521,000
E980	128	3.9 – 4.0	32	2,030,000
E980	40	3.7 – 3.9	40	611,300
E980	80	3.7 – 3.9	40	1,216,000
E980	120	3.7 – 3.9	40	1,827,000
E980	160	3.7 – 3.9	40	2,439,000
E980	44	3.58 – 3.9	44	639,000
E980	88	3.58 – 3.9	44	1,271,000
E980	132	3.58 – 3.9	44	1,910,000
E980	176	3.58 – 3.9	44	2,549,000
E980	48	3.55 – 3.9	48	687,500
E980	96	3.55 – 3.9	48	1,368,000
E980	144	3.55 – 3.9	48	2,055,600
E980	192	3.55 – 3.9	48	2,743,000

NOTE: POWER9 frequency is expressed as a range from Typical GHz to Max GHz.

FOOTNOTE 1: The S922, S924, and E980 by default will have its Power Management mode set to Max Performance. The S914 by default will have its Power Management mode set to Dynamic Performance. Both modes dynamically optimize the processor frequency at any given time based on CPU utilization and operating environmental conditions.

Section 3b –CPW Benchmark Performance (POWER 7 and POWER7+)

Performance results in this table 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	3.00	21,100 ¹
PS701	8	3.00	42,100 ²
PS702	16	3.00	76,300 ³
PS703	16	2.40	64,000 ³
PS704	32	2.40	110,000 ⁴
PFlex260	4	4.00	25,400 ⁵
PFlex260	8 (2x4c)	3.30	38,500 ⁶
PFlex260	16	3.22	80,500 ³
PFlex260	16	3.55	87,000 ³
PFlex260	8 (2x4c)	4.00	51,400 ⁶
PFlex260	16	3.60	99,500 ³
PFlex260	16	4.10	110,000 ³
PFlex270	24	3.10	123,500 ⁸
PFlex270	24	3.40	131,500 ⁸
PFlex460	16 (4x4c)	3.30	80,500 ³
PFlex460	32	3.22	150,000 ⁴
PFlex460	32	3.55	162,000 ⁴
PFlex460	16	4.00	109,500 ⁷
PFlex460	32	3.60	198,900 ⁹
PFlex460	32	4.10	219,900 ⁹
710	4	3.00	23,800
710	6	3.70	40,900
710	8	3.55	51,800
710	4	3.60	28,400
710	6	4.20	49,400
710	8	4.20	64,500
720	4	3.00	23,800
720	6	3.00	34,900
720	8	3.00	46,300
720	4	3.60	28,400
720	6	3.60	42,400
720	8	3.60	56,300
730	8	3.00	44,600
730	8	3.70	51,900
730	12	3.70	77,200
730	16	3.55	97,700
730	8	4.30	59,700
730	12	4.20	89,200
730	16	3.60	104,700
730	16	4.20	117,600
740	4	3.30	25,500
740	4	3.70	27,900
740	6	3.70	41,600
740	8	3.30	47,800
740	8	3.70	52,200
740	12	3.70	77,200
740	16	3.55	97,700

740	6	4.20	49,000
740	12	4.20	91,700
740	8	3.60	56,300
740	16	3.60	106,500
740	8	4.20	64,500
740	16	4.20	120,000
750	8	3.00	44,600
750	16	3.00	82,600
750	24	3.00	122,500
750	32	3.00	158,300
750	6	3.30	37,200
750	12	3.30	69,200
750	18	3.30	94,900
750	24	3.30	135,300
750	8	3.30	47,800
750	16	3.30	88,700
750	24	3.30	129,700
750	32	3.30	168,800
750	8	3.55	52,200
750	16	3.55	95,700
750	24	3.55	138,500
750	32	3.55	181,000
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	4.00	59,000
750	16	4.00	108,000
750	24	4.00	158,000
750	32	4.00	208,000
750	8	3.50	52,000
750	16	3.50	96,000
750	24	3.50	141,500
750	32	3.50	185,000
760	12	3.10	69,800
760	24	3.10	129,000
760	36	3.10	195,700
760	48	3.10	258,000
760	12	3.40	75,200
760	24	3.40	137,000
760	36	3.40	209,000 ¹⁰
760	48	3.40	274,000 ¹⁰
770	4	3.10	22,750
770	8	3.10	45,000
770	16	3.10	88,800
770	32	3.10	155,850
770	48	3.10	229,800 ¹⁰

770	64	3.10	292,700 ¹⁰
770	4	3.50	24,900
770	6	3.50	37,400
770	12	3.50	73,100
770	18	3.50	99,000
770	24	3.50	131,050
770	48	3.50	248,550 ¹⁰
770	4	4.22	30,700
770	6	4.22	45,800
770	9	4.22	68,200
770	12	4.22	90,000
770	24	4.22	154,800
770	36	4.22	242,600 ¹⁰
770	48	4.22	306,600 ¹⁰
770	4	3.80	28,700
770	8	3.80	56,100
770	16	3.80	110,000
770	24	3.80	146,700
770	32	3.80	191,500
770	48	3.80	290,500 ¹⁰
770	64	3.80	379,300 ¹⁰
780	4	3.80	26,600
780	8	3.80	54,400
780	16	3.80	105,200
780	32	3.80	177,400
780	48	3.80	265,200 ¹⁰
780	64	3.80	343,050 ¹⁰
780	8	4.10	57,450
780	16	4.10	114,850 ¹¹
780	24	4.10	172,450 ¹¹
780	32	4.10	229,650 ¹¹
780	4	4.42	32,400
780	8	4.42	63,200
780	16	4.42	123,500
780	24	4.42	164,700
780	32	4.42	214,000
780	48	4.42	326,100 ¹⁰
780	64	4.42	424,400 ¹⁰
780	4	3.72	28,500
780	8	3.72	56,000
780	16	3.72	108,500
780	24	3.72	159,600
780	32	3.72	209,500
780	64	3.72	414,900 ¹⁰
780	96	3.72	622,300 ¹⁰
780	128	3.72	829,800 ¹⁰
795	24	3.70	149,100
795	48	3.70	288,500 ¹⁰
795	32	4.00	204,300
795	64	4.00	399,200 ¹⁰
795	24	4.25	162,100
795	32	4.25	218,400 ¹²

FOOTNOTES:

1. CPW value for 3.7 cores of 4 total cores. 0.3 core is allocated for VIOS.
2. CPW value for 7.5 cores of 8 total cores. 0.5 core is allocated for VIOS.
3. CPW value for 15 cores of 16 total cores. 1 core is allocated for VIOS.
4. CPW value for 30 cores of 32 total cores. 2 cores are allocated for VIOS.
5. CPW value for 3.5 cores of 4 cores. 0.5 core is allocated for VIOS.

6. CPW value for 7 cores of 8 total cores. 1 core is allocated for VIOS.
7. CPW value for 15 cores of 16 total cores. 1 core is allocated for VIOS.
8. CPW value for 23 cores of 24 total cores. 1 core is allocated for VIOS.
9. CPW value for 31 cores of 32 total cores. 1 core is allocated for VIOS.
10. CPW is limited to 32 core partition sizes. Larger core configurations are measured with two or more partitions.
11. CPW values for the Power 780 with TurboCore enabled are measured with 8 core partitions.
12. CPW value for the 32 core Power 795 with TurboCore enabled is measured with 16 core partitions.

CPW values for POWER System i™ models not listed may be obtained from: <http://www.ibm.com/systems/resources/pcrm.pdf>

Section 4 – SPECjbb®2015 Benchmark Performance

Section 4a – SPECjbb®2015 Benchmark Performance (POWER9)

All 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	Proc /# Cores	GHz	Inst/Data L1 Cache	L2/L3/L4 Cache	SPECjbb2015-MultiJVM		OS Version
			(KB)/core	(MB)/system	max-jOPS	critical-jOPS	
S924	p9/24	3.4 - 3.9	64/64	12/240/-	165,581	56,942	SLES 12 SP3

NOTE: POWER9 frequency is expressed as a range from Typical GHz to Max GHz.

NOTE: The S924 by default will have its Power Management mode set to Max Performance. This mode dynamically optimizes the processor frequency at any given time based on CPU utilization and operating environmental conditions.

Section 4b – SPECjbb®2015 Benchmark Performance (POWER8)

Performance results in this table 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 /# Cores	GHz	Inst/Data L1 Cache	L2/L3/L4 Cache	SPECjbb2015-MultiJVM		OS Version
			(KB)/core	(MB)/system	max-jOPS	critical-jOPS	
S812LC	p8/10	2.92	32/64	5/80/32	44,883	13,032	Ubuntu 14.04.3

Section 5 – AIX SAP® Standard Application Benchmark Performance

Section 5a – SAP® Sales and Distribution (SD) 2-Tier – AIX (POWER5 to POWER8)

Performance results in this table 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	# 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	8 (4/16)	3752	.97	1,231	410,330	20.52	AIX 6.1	DB2 9.5	99%	EHP4	2009023

Model/Proc/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. #
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

Section 5b – SAP® Sales and Distribution (SD) 2-Tier – Linux on Power (POWER5 to POWER7+)

Performance results in this table 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	# 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)	1,000	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)	2,000	1.95	603	210,000	10.05	SLES9	DB2 V8.2.2	99%	4.7	2004057
570/P6/4.2	8 (4/16)	3,104	1.91	938	312,670	15.63	RHEL5.1	DB2 9.5	97%	6.0	2008002
730/P7/3.7	12 (2/24)	5,250	.98	1,721	573,670	28.68	SLES11	DB2 9.7	97%	EHP4	2011022
730/P7/3.55	16 (2/64)	7,000	.99	2,293	764,330	38.22	SLES11	DB2 9.7	97%	EHP4	2011042
7R2/p7+/4.22	16 (2/64)	8,016	.98	2,628	876,000	43.80	SLES 11	DB2 10	99%	EHP5	2013003
7R2/p7+/4.22	16 (2/64)	8,256	.97	2,709	903,000	45.13	RHEL6.4	DB2 10	99%	EHP5	2013006

Section 5c – SAP® Business Warehouse – Enhanced Mixed Load — Linux on Power (POWER8)

Performance results in this table 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

Section 6 – AIX Oracle® e-Business Suite (eBS) Benchmark Performance (POWER8)

Performance results in this table 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 7 – AIX Oracle® Siebel Benchmark Performance (POWER7 and POWER8)

Performance results in this table 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.

Oracle® 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: <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 and Linux and the latest versions of IBM's high-performance C, C++, and FORTRAN compilers for AIX and Linux were used. All other systems used previous versions of the operating systems and compilers.

SPEC® CPU2017 - SPEC CPU2017 focuses on compute-intensive performance including the processor, memory subsystem, and compilers. The benchmark does not stress other components such as networking, graphics, Java libraries and the I/O system. Compared to the SPEC CPU2006, the total source code has increased because most benchmarks in this suite are derived from real applications. **SPECrate 2017 Integer** suite has ten benchmarks, and the **SPECrate 2017 Floating Point** suite has thirteen benchmarks. For the detailed explanation of this benchmark, the metrics, and the run rules, please refer to the Web: <https://www.spec.org/cpu2017/Docs/overview.html>

SPEC® CPU2006 - SPEC CPU2006 focuses on compute-intensive performance including the processor, memory subsystem, and compilers. The benchmark does not stress other components such as networking, graphics, Java libraries and the I/O system. **SPECrate 2006 Integer** suite has twelve benchmarks, and the **SPECrate 2006 Floating Point** suite has seventeen benchmarks. For the detailed explanation of this benchmark, the metrics, and the run rules, please refer to the Web: <https://www.spec.org/cpu2006/Docs/readme1st.html>

SPECjbb®2015 - 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. For the detailed explanation of this benchmark, the metrics, and the run rules, please refer to the Web: <https://www.spec.org/jbb2015/docs/userguide.pdf>

Application Benchmarks

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

Oracle® Applications - Benchmark overview information: <http://www.oracle.com/us/solutions/benchmark/apps-benchmark/index.html>

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/resources/pcrm.pdf>.

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.



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