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Fujitsu M10 Standard Benchmark Results

Rev 4.0

FOrCE (Fujitsu Oracle Center of Excellence)
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Restriction

- The Fujitsu M10 benchmark numbers shown on the following pages are the result of benchmark testing done by Fujitsu.
- Fujitsu M10 benchmark testing is ongoing. More configurations and different types of benchmark tests are and will be conducted. Expect updates to this material from time to time.

Standard Benchmarks Results – SPECint_rate2006

Standard BMT	Sockets	Fujitsu M10 3.7GHz/16Core	Oracle M7 4.13GHz/32Core	Oracle T5 3.6GHz/16Core	Oracle M6 3.6GHz/12Core	Intel HW-EX 2.5 GHz/18Core	Intel IB-EP 2.7GHz/12Core	Intel HW-EP 2.3GHz/18Core	Intel IB-EX 2.8GHz/15Core	IBM P7 4GHz/8Core	IBM P7+ 3.7GHz/8Core	IBM P8 3.5GHz/6Core
SPECint rate2006	1	546 468 M10-1 3.2G 307 M10-1 3.7G/8core	1,200	489			488	715		289 3.5G		642 2.92G 10cores
	2					1,440	972	1,480	1,200	652 3.86G	884 4.2G	1,100 2.92G 10cores
	4	2,180 1,970 M10-4 3.4G 1,230 M10-4 3.7G/8core				2,880 2.8G	1,800 2.4G	2,570 2.1G	2,420	1,440	1,720 4.1G	1,750
	8			3,750		5,670			4,740	2,770 3.92G		5,400 4.35G 8cores 6,320 4.19G 10cores
	16	8,290				11,100			9,470[1]		6,130	14,400 4.00G 12cores
	32	#1 12,500 M10-4S 3.0G							18,600[1]	11,300		
	64	#1 31,400										

NOTE: HW-EX (18core) = E7-8890 v3
IB-EP (12core) = E5-2697v2 / E5-4657L v2
HW-EP (18core) = E5-2699 v3 / E5-4669 v3
IB-EX (15core) = E7-8890 v2 / E7-4890 v2 / E7-2890 v2

1: Results for SGI's UV 300 supercomputer

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Standard Benchmarks Results – SPECfp_rate2006

Standard BMT	Sockets	Fujitsu M10 3.7GHz/16Core	Oracle M7 4.13GHz/32Core	Oracle T5 3.6GHz/16Core	Oracle M6 3.6GHz/12Core	Intel HW-EX 2.5 GHz/18Core	Intel IB-EP 2.7GHz/12Core	Intel HW-EP 2.3GHz/18Core	Intel IB-EX 2.8GHz/15Core	IBM P7 4GHz/8Core	IBM P7+ 3.7GHz/8Core	IBM P8 3.5GHz/6Core
SPECfp rate2006	1	462 425 M10-1 3.2G	832	369			345	474		248 3.5G		468 2.92G 10cores
	2					1,030	701	989 2.4G	881	586 3.86G	602 4.2G	888 2.92G 10cores
	4	1,830 1,750 M10-4 3.4G				2,050		1,790 2.1G	1,770	985 3.6G	1,150 4.1G	1,370
	8			3,020		3,980			3,470	2,640		4,470 4.35G 8cores 5,130 4.19G 10cores
	16	7,200				7,670			6,900		4,180	11,400
	32								13,600	10,500		4.00G 12cores
	64	#1 19,700 M10-4S 3.0G										

NOTE: HW-EX (18core) = E7-8890 v3
IB-EP (12core) = E5-2697v2
HW-EP (18core) = E5-2699 v3 / E5-4669 v3
IB-EX (15core) = E7-8890 v2 / E7-4890 v2 / E7-2890 v2

Standard Benchmarks Results – SPECjbb

Standard BMTs		Sockets	Fujitsu M10 3.7GHz/16Core	Oracle M7 4.13GHz/32Core	Oracle T5 3.6GHz/16Core	Oracle M6 3.6GHz/12Core	Intel HW-EX 2.5GHz/18Core	Intel IB-EP 2.7GHz/12Core	Intel HW-EP 2.3GHz/18Core	Intel IB-EX 2.8GHz/15Core	IBM P7 4GHz/8Core	IBM P7+ 3.7GHz/8Core	IBM P8 3.6GHz/6Core
SPECjbb 2005		32									21,058K		
		64	#1 35,912K M10-4S 3.0G										
SPECjbb 2015	MAX	1		120,603					47,334				44,883 2.92G 10cores
		2			80,889			52,482	97,551 80,889				
		4					171,642	Single Submission		Single Submission			
		8					224,203						
		16					416,200			341,516			
	Critical	1		60,280					9,876				13,032 2.92G 10cores
		2			37,422			19,614	43,654 28,318				
		4					99,646						
		8					83,250						
		16					82,508			78,544			

NOTE: HW-EX (18core) = E7-8890 v3
IB-EP (12core) = E5-2697v2 / E5-4657L v2
HW-EP (18core) = E5-2699 v3
IB-EX (15core) = E7-8890 v2 / E7-4890 v2 / E7-2890 v2

NOTE: Defects have been identified in the SPECjbb2013 benchmark. We have removed all SPECjbb2013 results from this slide deck. For more information, please see: http://www.spec.org/jbb2013/results/

Standard Benchmarks Results – STREAM Triad

Standard BMT	Sockets	Fujitsu M10 3.7GHz/16Core	Oracle M7 4.13GHz/32Core	Oracle T5 3.6GHz/16Core	Oracle M6 3.6GHz/12Core	Intel HW-EX 2.5 GHz/18Core	Intel IB-EP 2.7GHz/12Core	Intel HW-EP 2.3GHz/18Core	Intel IB-EX 2.8GHz/15Core	IBM P7 4GHz/8Core	IBM P7+ 3.7GHz/8Core	IBM P8 3.6GHz/6Core
STREAM Triad (MB/s)	1	65,003 M10-4S 3.0G		77,258								
		64,913 M10-1 2.8G										
	2			155,017			90,784 2.8G 10core	111,760 2.6G 10core				
	4	259,313 M10-4S 3.0G		320,506					245,068		122,766	
		259,134 M10-4 2.8G										
	8			642,884								
	16	#1 1,023,643 M10-4S 3.0G										
	32	#1 2,071,809 M10-4S 3.0G								805,804 P6		
	64	#1 4,002,703 M10-4S 3.0G										

NOTE: HW-EP (18core / 10core) = E5-2699 v3 / E5-2660 v3
IB-EP (10core) = E5-2680 v2
IB-EX (15core) = E7-8890 v2 / E7-4890 v2 / E7-2890 v2

Standard Benchmarks Results – SAP SD Two-Tier

Standard BMT	Sockets	Fujitsu M10 3.7GHz/16Core	Oracle M7 4.13GHz/32core	Oracle T5 3.6GHz/16Core	Oracle M6 3.6GHz/12Core	Intel HW-EX 2.5 GHz/18Core	Intel HW-EP 2.3GHz/18Core	Intel IB-EX 2.8GHz/15Core	IBM P7 4GHz/8Core	IBM P7+ 3.7GHz/8Core	IBM P8 3.6GHz/6Core
SAP SD Two-Tier	2		30,800 users 168,600 SAPS				16,500 users 90,120 SAPS				
	4					31,000 users 170,030 SAPS	29,254 users 159,680 SAPS	25,451 users 138,900 SAPS			21,212 users 115,870 SAPS
	8			40,000 users 220,950 SAPS		60,000 users 330,930 SAPS		49,000 users 271,080 SAPS			79,750 users 436,100 SAPS 4.19G 10cores
	16	82,000 users 448,830 SAPS						84,000 users 459,580 SAPS	70,032 users 384,330 SAPS		
	32	#1 153,050 users 836,550 SAPS			140,000 users 793,930 SAPS				126,063 users 688,630 SAPS		
	40	153,000 users 844,420 SAPS	M10-4S 3.0G								

NOTE: HW-EX (18core) = E7-8890 v3
HW-EP (18core) = E5-2699 v3 / E5-4669 v3
IB-EX (15core) = E7-8890 v2 / E7-4890 v2 / E7-2890 v2

Standard Benchmarks Results – TPC-H

Standard BMT	Sockets	Fujitsu M10 3.7GHz/16Core	Oracle M7 4.13GHz/32Core	Oracle T5 3.6GHz/16Core	Intel IB-EP 2.7GHz/8Core	Intel HW-EP 2.3GHz/18Core	Intel IB-EX 2.8GHz/15Core	IBM P7 4.14GHz/4Core
TPC-H 1000GB	2				304,361 QphH (3.0G 10core) 0.73 QphH/price (USD)	390,590 QphH 0.97 QphH/price (USD)		
	4	326,454 QphH (M10-4S 3.0G) 1524.25 QphH/price (JPY)		"Historic Result" (*) 201,487 QphH (T4-4 3.0G) 4.60 QphH/price (USD)	445,529 QphH 0.75 QphH/price (USD)		588,831 QphH 0.97 QphH/price (USD)	
	8							"Historic Result" (*) 164,747 QphH 6.85 QphH/price (USD)

NOTE: TPC defines *Historic Results* as results "which might not be up to date with regards to pricing and/or availability of HW or SW."

Key Takeaways

- Fujitsu M10 currently holds 8 world records 

in standard performance benchmarks. More record breaking results are expected.
- Fujitsu M10's STREAM benchmark results prove the benefits of SOC and LLC, and indicate the response time advantages for user processing.
- Fujitsu M10-4S competes well in general high-end server spaces.
- Fujitsu M10-1 and M10-4 competitive focus: IBM POWER Server.
- Fujitsu M10-1 and M10-4 also competitive for SPARC Enterprise M-series and PRIMEPOWER replacement and consolidation.
- Enhanced Fujitsu M10 models (with SPARC64 X+ CPUs) increase the performance lead of Fujitsu M10.
- Fujitsu M10-1 and M10-4 models with 3.7GHz max 8 core SPARC64 X+ CPUs offer the highest per core performance in the entire SPARC portfolio.

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Best Performance for Business Workloads

Faster memory Throughput	STREAM TRIAD	1 1 1
#1 Arithmetic Performance	SPECint_rate 2006	1 1
#1 Application Performance	2-tier SAP SD	1
#1 Scientific Performance	SPECfp_rate 2006	1
#1 Java Performance	SPECjbb2005	1

as of December 2015

Benchmark Results Sources

Published Benchmark Results found in this presentation were taken from:

- SPECint_rate2006, SPECfp_rate2006, SPECjbb2005 and SPECjbb2015 results: http://www.spec.org/
- STREAM Triad results: http://www.cs.virginia.edu/stream/by_date/Bandwidth.html
- SAP SD Two-Tier results: http://global.sap.com/solutions/benchmark/sd2tier.epx
- TPC-H results: http://www.tpc.org/tpch/default.asp
- Fujitsu M10 benchmark results are summarized here:
  http://www.fujitsu.com/global/products/computing/servers/unix/sparc/key-reports/benchmarks/

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