SPEC CPU 2006调研

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性能指标

SPEC 主要测试 CPU 的整数和浮点数运算，即 SPECint 和 SPECfp。其中 SPECint2006 包含12个不同的基准测试和 SPECfp2006 包含19个不同的基准测试，如下图所示：

Integer Benchmarks

400.perlbench	C	PERL Programming Language
401.bzip2	C	Compression
403.gcc	C	C Compiler
429.mcf	C	Combinatorial Optimization
445.gobmk	C	Artificial Intelligence: go
456.hmmer	C	Search Gene Sequence
458.sjeng	C	Artificial Intelligence: chess
462.libquantum	C	Physics: Quantum Computing
464.h264ref	C	Video Compression
471.omnetpp	C++	Discrete Event Simulation
473.astar	C++	Path-finding Algorithms
483.xalancbmk	C++	XML Processing

Floating Point Benchmarks

410.bwaves	Fortran	Fluid Dynamics
416.gamess	Fortran	Quantum Chemistry
433.milc	C	Physics: Quantum Chromodynamics
434.zeusmp	Fortran	Physics / CFD
435.gromacs	C/Fortran	Biochemistry/Molecular Dynamics
436.cactusADM	C/Fortran	Physics / General Relativity
437.leslie3d	Fortran	Fluid Dynamics
444.namd	C++	Biology / Molecular Dynamics
447.dealII	C++	Finite Element Analysis
450.soplex	C++	Linear Programming, Optimization
453.povray	C++	Image Ray-tracing
454.calculix	C/Fortran	Structural Mechanics
459.GemsFDTD	Fortran	Computational Electromagnetics
465.tonto	Fortran	Quantum Chemistry
470.lbm	C	Fluid Dynamics
481.wrf	C/Fortran	Weather Prediction
482.sphinx3	C	Speech recognition

Case

#	HARDWARE VENDOR	SYSTEM	RESULT	BASELINE	CORES	CHIPS	CORES PER CHIP	PUBLISHED
1	ACTION S.A.	ACTINA SOLAR 110 S6 (Intel Xeon E3-1220 v3, 3.10 GHz)	58.7	56.9	4	1	4	Dec-2015

#	HARDWARE VENDOR	SYSTEM	RESULT	BASELINE	CORES	CHIPS	CORES PER CHIP	PUBLISHED
2	ACTION S.A.	ACTINA SOLAR 202 S6 (Intel Xeon E5-2697 v3, 2.60 GHz)	67.5	64.4	28	2	14	Dec-2015

可以看到，该测试中，1号频率为3.10G，2号频率为2.60G，但2号得分较高。可能原因为CPU的架构和核数等原因，频率并不是唯一指标。

但是比较详细指标，如下图所示，

1号机器：

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	**242**	**40.5**	242	40.3	240	40.8	217	45.0	217	45.0	217	45.1
401.bzip2	369	26.1	367	26.3	**368**	**26.3**	361	26.7	361	26.7	**361**	**26.7**
403.gcc	211	38.2	**211**	**38.2**	211	38.2	209	38.6	209	38.5	208	38.6
429.mcf	**129**	**70.6**	129	70.6	129	70.8	129	70.7	130	70.3	127	71.7
445.gobmk	358	29.3	357	29.4	**357**	**29.4**	363	28.9	362	29.0	**363**	**28.9**
456.hmmer	133	70.2	133	70.2	**133**	**70.2**	137	68.1	138	67.8	137	68.1
458.sjeng	**361**	**33.5**	361	33.5	362	33.5	354	34.1	354	34.2	**354**	**34.2**
462.libquantum	13.1	1580	**13.4**	**1550**	13.6	1520	13.1	1580	**13.4**	**1550**	13.6	1520
464.h264ref	389	56.9	385	57.5	**388**	**57.1**	389	56.9	385	57.5	**388**	**57.1**
471.omnetpp	233	26.8	235	26.6	**234**	**26.7**	198	31.5	197	31.7	**197**	**31.7**
473.astar	**205**	**34.2**	205	34.2	204	34.3	206	34.1	204	34.4	**206**	**34.1**
483.xalancbmk	95.5	72.3	**96.1**	**71.8**	96.2	71.7	**85.8**	**80.4**	86.2	80.0	85.6	80.6

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

2号机器：

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	**236**	**41.4**	237	41.3	235	41.5	217	45.0	217	45.1	218	44.8
401.bzip2	**395**	**24.4**	396	24.4	395	24.4	386	25.0	386	25.0	**386**	**25.0**
403.gcc	**225**	**35.8**	225	35.8	224	36.0	224	35.9	225	35.8	**225**	**35.8**
429.mcf	**165**	**55.2**	165	55.1	165	55.2	163	56.1	161	56.6	164	55.6
445.gobmk	**347**	**30.2**	348	30.2	347	30.2	353	29.7	353	29.7	353	29.7
456.hmmer	**130**	**71.5**	131	71.5	130	71.6	134	69.5	134	69.4	**134**	**69.4**
458.sjeng	356	34.0	**356**	**34.0**	356	34.0	349	34.7	349	34.7	349	34.7
462.libquantum	3.07	6760	3.07	6760	**3.07**	**6760**	3.07	6760	3.07	6760	**3.07**	**6760**
464.h264ref	397	55.7	396	55.9	**396**	**55.9**	397	55.7	396	55.9	**396**	**55.9**
471.omnetpp	**157**	**39.9**	155	40.4	158	39.5	114	54.9	**114**	**54.6**	115	54.4
473.astar	**205**	**34.2**	204	34.3	206	34.0	205	34.3	205	34.3	204	34.5
483.xalancbmk	**102**	**67.8**	102	67.9	102	67.7	**89.0**	**77.5**	89.0	77.5	89.0	77.5

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

可以看到，虽然整体分数2号更高，但有些指标如bzip2，gcc，mcf，sjeng等程序，1号更胜一筹。