SPEC® CFP2006 Result

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Cisco Systems

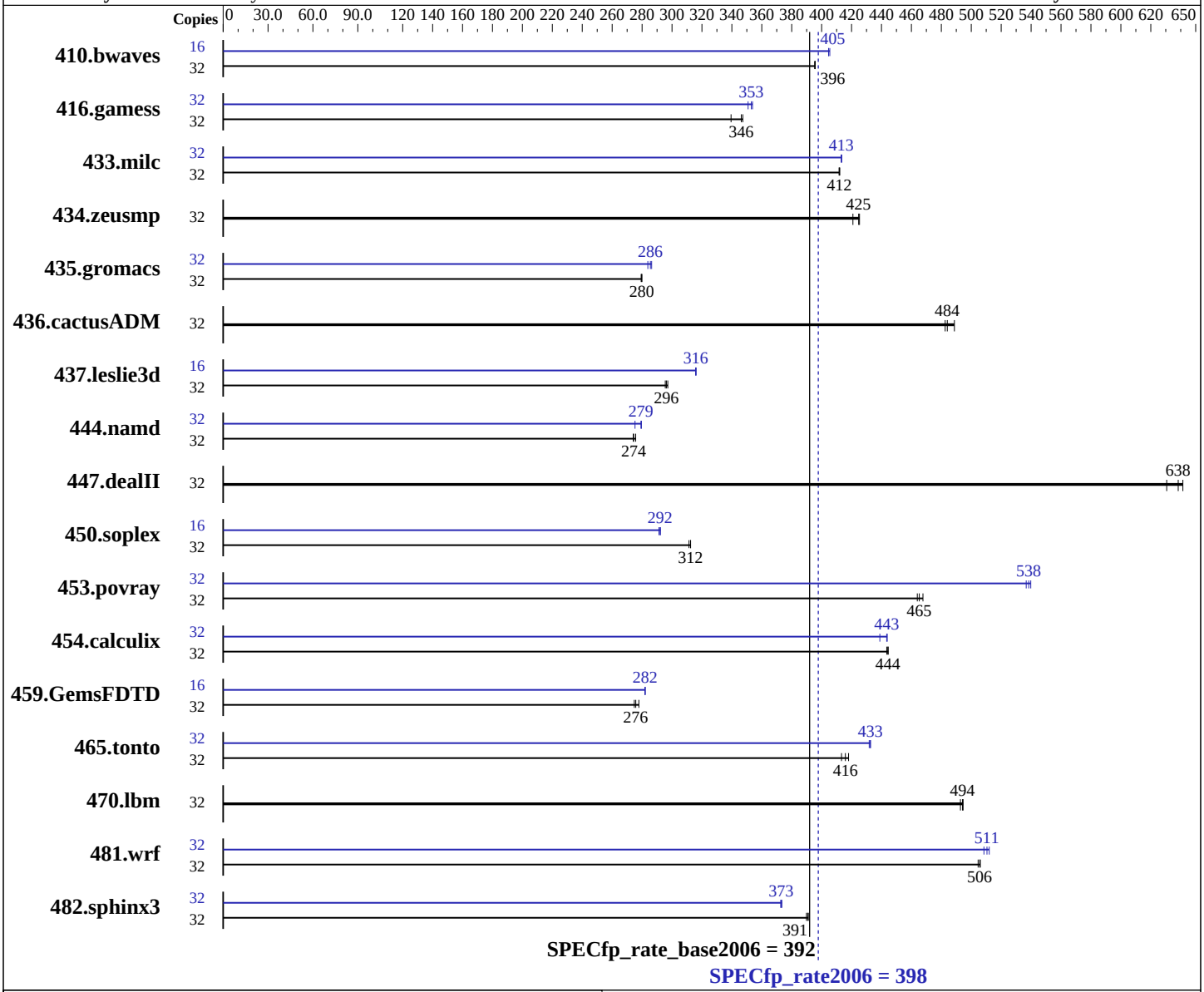
Cisco UCS C420 M3 (Intel Xeon E5-4603, 2.00 GHz)

SPECfp®_rate2006 = 398

SPECfp_rate_base2006 = 392

CPU2006 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

Test date: Feb-2013
Hardware Availability: Sep-2012
Software Availability: Jun-2012



Hardware

CPU Name:	Intel Xeon E5-4603
CPU Characteristics:	
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable:	1,2,3,4 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

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Software

Operating System:	Red Hat Enterprise Linux Server release 6.3 (Santiago) 2.6.32-279.el6.x86_64
Compiler:	C/C++: Version 12.1.3.293 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.3.293 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	ext4

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L3 Cache: 10 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz and CL7)
Disk Subsystem: 1 X 500 GB 10000 RPM SAS
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	1100	395	1099	396	**1099**	**396**	16	537	405	536	405	**537**	**405**
416.gamess	32	1846	339	**1809**	**346**	1804	347	32	1786	351	**1775**	**353**	1771	354
433.milc	32	714	412	**713**	**412**	713	412	32	**711**	**413**	711	413	711	413
434.zeusmp	32	685	425	**686**	**425**	692	421	32	685	425	**686**	**425**	692	421
435.gromacs	32	818	279	**817**	**280**	816	280	32	805	284	798	286	**800**	**286**
436.cactusADM	32	782	489	**790**	**484**	792	483	32	782	489	**790**	**484**	792	483
437.leslie3d	32	1012	297	**1015**	**296**	1018	295	16	476	316	476	316	**476**	**316**
444.namd	32	936	274	**935**	**274**	931	276	32	932	275	918	280	**919**	**279**
447.dealII	32	**574**	**638**	580	631	571	641	32	**574**	**638**	580	631	571	641
450.soplex	32	857	311	854	312	**854**	**312**	16	458	291	**457**	**292**	457	292
453.povray	32	367	464	**366**	**465**	364	468	32	**316**	**538**	317	537	315	540
454.calculix	32	594	445	595	444	**594**	**444**	32	601	439	**595**	**443**	595	444
459.GemsFDTD	32	1222	278	**1231**	**276**	1236	275	16	**602**	**282**	602	282	602	282
465.tonto	32	762	413	753	418	**757**	**416**	32	729	432	728	433	**728**	**433**
470.lbm	32	**890**	**494**	889	495	892	493	32	**890**	**494**	889	495	892	493
481.wrf	32	706	506	708	505	**707**	**506**	32	703	508	**700**	**511**	698	512
482.sphinx3	32	1600	390	**1596**	**391**	1595	391	32	1670	373	1673	373	**1673**	**373**

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
BIOS Configuration:
Processor Power State C6 set to Disabled
Processor Power State C1 Enhanced set to Disabled
Power Technology set to Custom
Energy Performance set to Performance
DRAM Clock Throttling set to Performance
 Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6800
 $Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
 running on localhost.localdomain Thu Feb 21 11:51:58 2013

 This section contains SUT (System Under Test) info as seen by
 some common utilities.  To remove or add to this section, see:
   http://www.spec.org/cpu2006/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : Intel(R) Xeon(R) CPU E5-4603 0 @ 2.00GHz
       4 "physical id"s (chips)
       32 "processors"
    cores, siblings (Caution: counting these is hw and system dependent.  The
    following excerpts from /proc/cpuinfo might not be reliable.  Use with
    caution.)
       cpu cores : 4
       siblings  : 8
       physical 0: cores 0 1 2 3
       physical 1: cores 0 1 2 3
       physical 2: cores 0 1 2 3
       physical 3: cores 0 1 2 3
    cache size : 10240 KB

 From /proc/meminfo
    MemTotal:       264505024 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.3 (Santiago)

 From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.3 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.3 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

 uname -a:
    Linux localhost.localdomain 2.6.32-279.el6.x86_64 #1 SMP Wed Jun 13 18:24:36
    EDT 2012 x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Feb 21 11:12

 SPEC is set to: /opt/cpu2006-1.2
    Filesystem     Type    Size  Used Avail Use% Mounted on
    /dev/sda1      ext4    458G   51G  384G  12% /
```

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Platform Notes (Continued)

```
 Additional information from dmidecode:
   Memory:
    8x 0xCE00 M393B1K70DH0-YH9 8 GB 1333 MHz 2 rank
    24x 0xCE00 M393B1K70DH0-YK0 8 GB 1600 MHz 2 rank

 (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64"
Intel HT Technology = enable
 Binaries compiled on a system with 2 X Intel Xeon E5-2690 CPU + 128 GB memory using RHEL 6.2
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
```

Base Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

Base Portability Flags

```
     410.bwaves: -DSPEC_CPU_LP64
     416.gamess: -DSPEC_CPU_LP64
       433.milc: -DSPEC_CPU_LP64
     434.zeusmp: -DSPEC_CPU_LP64
    435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
    437.leslie3d: -DSPEC_CPU_LP64
      444.namd: -DSPEC_CPU_LP64
     447.dealII: -DSPEC_CPU_LP64
     450.soplex: -DSPEC_CPU_LP64
     453.povray: -DSPEC_CPU_LP64
    454.calculix: -DSPEC_CPU_LP64 -nofor_main
```

Continued on next page

Base Portability Flags (Continued)

459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):
icpc -m64

450.soplex: icpc -m32

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32 -opt-mem-layout-trans=3

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -static -unroll2

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -auto-ilp32 -opt-mem-layout-trans=3

Fortran benchmarks:

410.bwaves: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static

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Peak Optimization Flags (Continued)

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo -O3 -no-prec-div -prof-use(pass 2) -xSSE4.2 -opt-prefetch -static -auto-ilp32 -opt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -static -auto-ilp32 -opt-mem-layout-trans=3

481.wrf: Same as 454.calculix

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130607.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130607.xml

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Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 14:13:14 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 26 March 2013.