SPEC® CFP2006 Result
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Cisco Systems

Cisco UCS B420 M3 (Intel Xeon E5-4603, 2.00 GHz)

$SPECfp^®\_rate2006 = 399$

$SPECfp\_rate\_base2006 = 393$
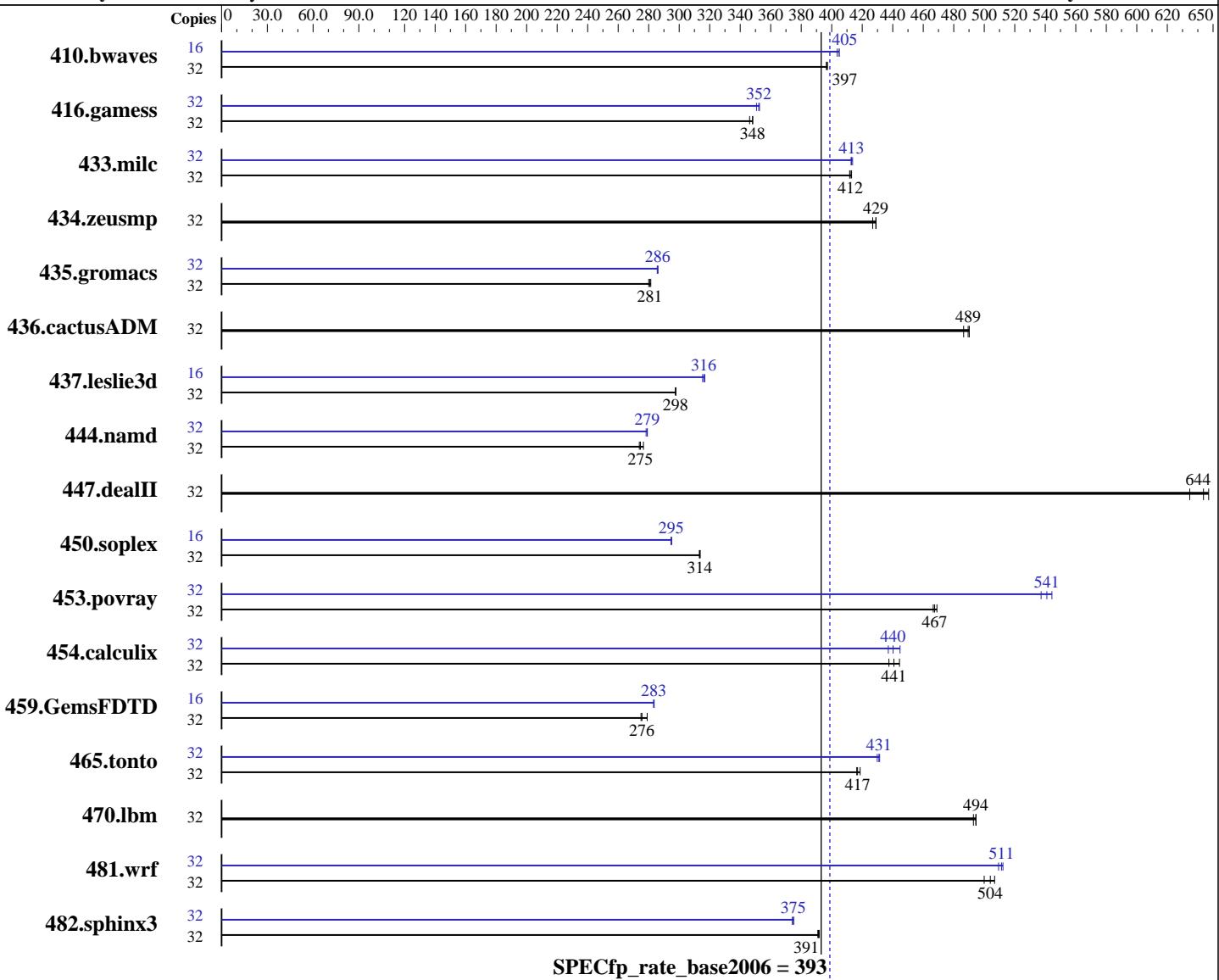
CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Dec-2012

Hardware Availability: Sep-2012

Software Availability: Feb-2012

Benchmark	Copies	Result
410.bwaves	16	405
410.bwaves	32	397
416.gamess	32	352
416.gamess	32	348
433.milc	32	413
433.milc	32	412
434.zeusmp	32	429
435.gromacs	32	286
435.gromacs	32	281
436.cactusADM	32	489
437.leslie3d	16	316
437.leslie3d	32	298
444.namd	32	279
444.namd	32	275
447.dealII	32	644
450.soplex	16	295
450.soplex	32	314
453.povray	32	541
453.povray	32	467
454.calculix	32	440
454.calculix	32	441
459.GemsFDTD	16	283
459.GemsFDTD	32	276
465.tonto	32	431
465.tonto	32	417
470.lbm	32	494
481.wrf	32	511
481.wrf	32	504
482.sphinx3	32	375
482.sphinx3	32	391

SPECfp_rate_base2006 = 393

SPECfp_rate2006 = 399

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 chips

Primary Cache: 32 KB I + 32 KB D on chip per core

Secondary Cache: 256 KB I+D on chip per core

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 6.2 (Santiago)
2.6.32-220.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 300 GB 15000 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	1095	397	**1096**	**397**	1097	397	16	**537**	**405**	537	405	539	404
416.gamess	32	1810	346	**1800**	**348**	1799	348	32	1787	351	**1779**	**352**	1777	353
433.milc	32	711	413	**713**	**412**	713	412	32	712	413	**711**	**413**	710	414
434.zeusmp	32	679	429	682	427	**679**	**429**	32	679	429	682	427	**679**	**429**
435.gromacs	32	812	281	816	280	**814**	**281**	32	799	286	800	286	**799**	**286**
436.cactusADM	32	**781**	**489**	780	490	786	486	32	**781**	**489**	780	490	786	486
437.leslie3d	32	1011	298	1010	298	**1011**	**298**	16	477	315	475	317	**476**	**316**
444.namd	32	**935**	**275**	928	277	937	274	32	**920**	**279**	922	278	919	279
447.dealII	32	566	647	**569**	**644**	577	635	32	566	647	**569**	**644**	577	635
450.soplex	32	**851**	**314**	852	313	851	314	16	452	295	453	295	**453**	**295**
453.povray	32	**364**	**467**	365	467	363	469	32	313	544	**315**	**541**	317	537
454.calculix	32	603	438	**599**	**441**	594	444	32	604	437	594	445	**600**	**440**
459.GemsFDTD	32	**1232**	**276**	1217	279	1235	275	16	599	284	**599**	**283**	599	283
465.tonto	32	**755**	**417**	756	416	752	419	32	**731**	**431**	733	430	730	431
470.lbm	32	892	493	**889**	**494**	889	495	32	892	493	**889**	**494**	889	495
481.wrf	32	715	500	**709**	**504**	705	507	32	702	509	698	512	**699**	**511**
482.sphinx3	32	**1594**	**391**	1595	391	1592	392	32	**1664**	**375**	1663	375	1667	374

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"

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CPU2006 license: 9019			**Test date:**	Dec-2012
Test sponsor:	Cisco Systems		**Hardware Availability:**	Sep-2012
Tested by:	Cisco Systems		**Software Availability:**	Feb-2012

Platform Notes

```
BIOS Configuration:
Hyper-Threading set to Enabled
Processor C6 Report set to Disabled
Processor C1E set to Disabled
CPU Performance set to HPC
LV DDR Mode set to Performance-mode
 Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6800
 $Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
 running on SPECCPU-M3 Sun Dec  2 16:13:42 2012

 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:       264505740 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /usr/bin/lsb_release -d
    Red Hat Enterprise Linux Server release 6.2 (Santiago)

 From /etc/*release* /etc/*version*
    redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
    system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

 uname -a:
    Linux SPECCPU-M3 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Nov 29 14:27

 SPEC is set to: /opt/cpu2006-1.2
    Filesystem      Type     Size  Used Avail Use% Mounted on
    /dev/sda2       ext4     1.1T   36G 1007G   4% /
```

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Platform Notes (Continued)

```
  Additional information from dmidecode:
    Memory:
      32x 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"

 Binaries compiled on a system with 2 X Intel Xeon E5-2690 CPU + 128 GB memory using RHEL6.2
 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
    459.GemsFDTD: -DSPEC_CPU_LP64
```

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Base Portability Flags (Continued)

```
  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
```

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Tested by: Cisco Systems		**Software Availability:**	Feb-2012

Peak Portability Flags (Continued)

```
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

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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