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 date:** Feb-2013
Test sponsor: Cisco Systems	**Hardware Availability:** Sep-2012
Tested by: Cisco Systems	**Software Availability:** Jun-2012

SPECfp_rate_base2006 = 392

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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

Continued on next page

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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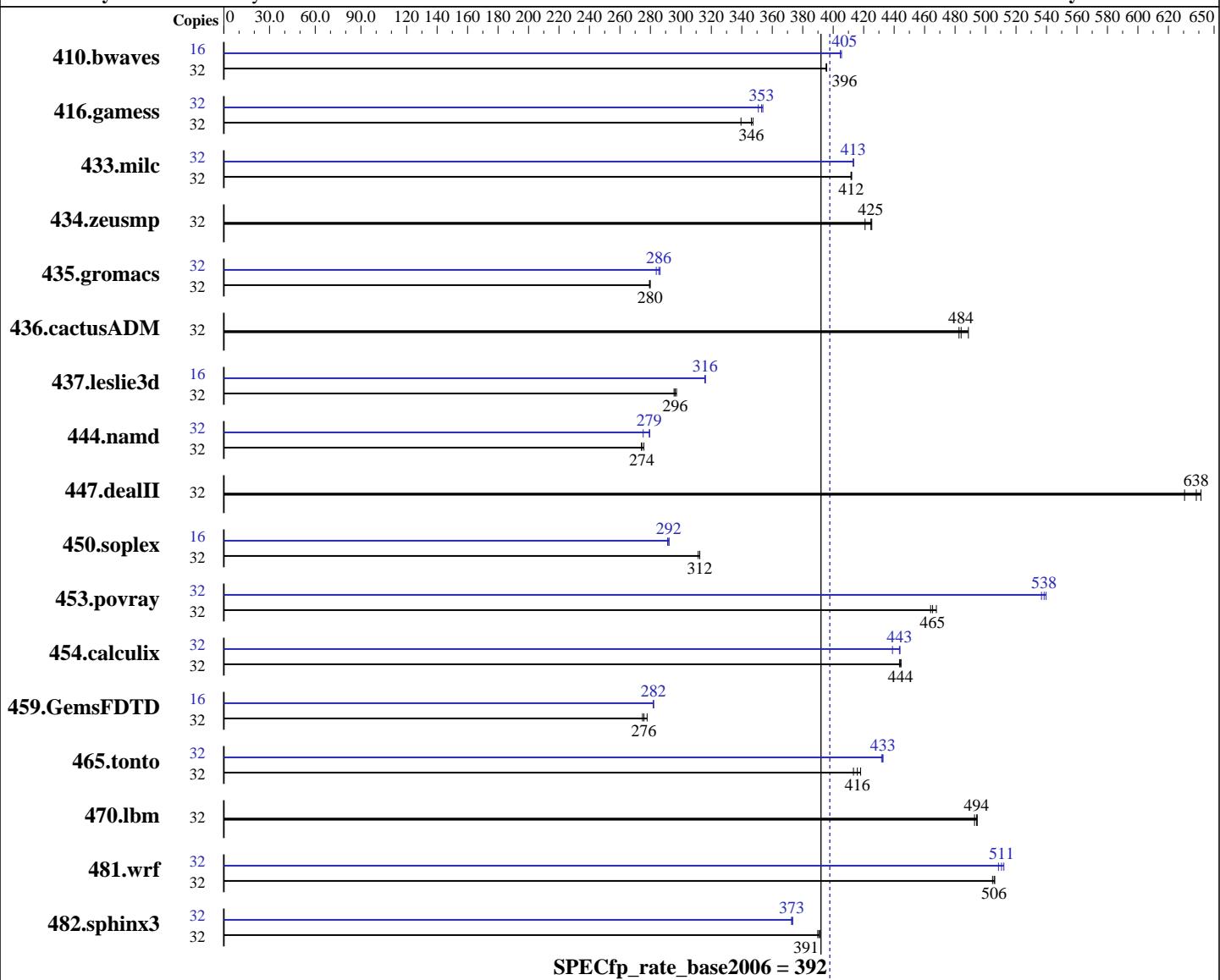SPECfp_rate_base2006 = 392

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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"

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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

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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
```

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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

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

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