# SPEC® CFP2006 Result

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## Cisco Systems

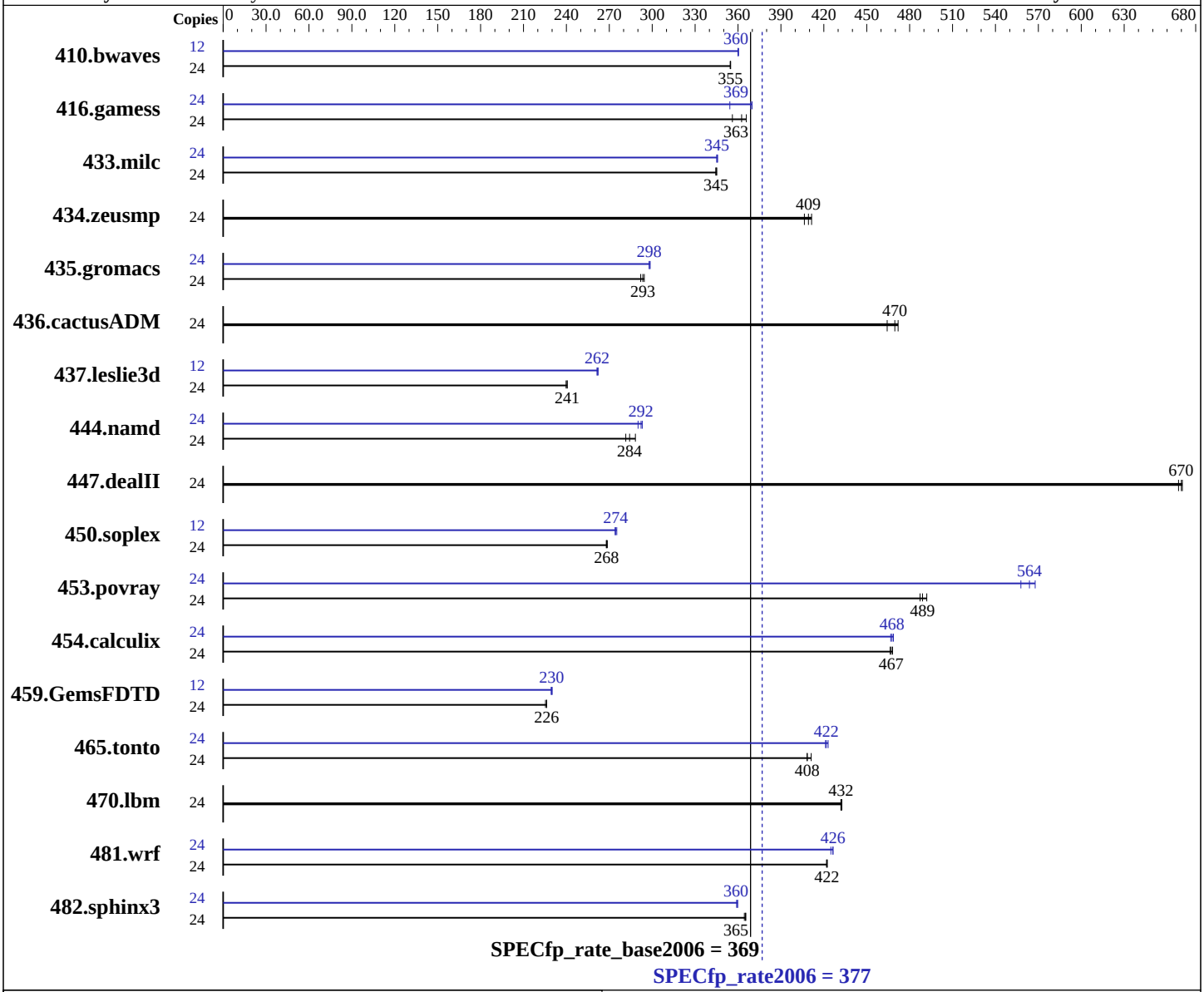
Cisco UCS C220 M3 (Intel Xeon E5-2640, 2.50 GHz)

SPECfp®_rate2006 = 377

SPECfp_rate_base2006 = 369

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

**Test date:** Apr-2012
**Hardware Availability:** Jun-2012
**Software Availability:** Dec-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2640 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.00 GHz |
| CPU MHz: | 2500 |
| FPU: | Integrated |
| CPU(s) enabled: | 12 cores, 2 chips, 6 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1,2 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 6.2 (Santiago)<br>2.6.32-220.el6.x86_64 |
| Compiler: | C/C++: Version 12.1.3.293 of Intel C++ Studio XE for Linux;<br>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: 15 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz and CL7)
Disk Subsystem: 1 X 300 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 | 24 | **920** | **355** | 920 | 355 | 919 | 355 | 12 | 453 | 360 | **453** | **360** | 452 | 360 |
| 416.gamess | 24 | **1296** | **363** | 1320 | 356 | 1285 | 366 | 24 | **1274** | **369** | 1271 | 370 | 1326 | 354 |
| 433.milc | 24 | 638 | 345 | 640 | 344 | **639** | **345** | 24 | 638 | 345 | **638** | **345** | 637 | 346 |
| 434.zeusmp | 24 | 531 | 411 | 537 | 406 | **534** | **409** | 24 | 531 | 411 | 537 | 406 | **534** | **409** |
| 435.gromacs | 24 | 582 | 294 | **584** | **293** | 587 | 292 | 24 | 574 | 299 | 575 | 298 | **575** | **298** |
| 436.cactusADM | 24 | 608 | 472 | **611** | **470** | 618 | 464 | 24 | 608 | 472 | **611** | **470** | 618 | 464 |
| 437.leslie3d | 24 | **938** | **241** | 938 | 241 | 941 | 240 | 12 | **431** | **262** | 430 | 262 | 431 | 261 |
| 444.namd | 24 | **677** | **284** | 668 | 288 | 684 | 282 | 24 | **659** | **292** | 657 | 293 | 663 | 290 |
| 447.dealII | 24 | 409 | 671 | 411 | 668 | **410** | **670** | 24 | 409 | 671 | 411 | 668 | **410** | **670** |
| 450.soplex | 24 | 747 | 268 | 745 | 269 | **747** | **268** | 12 | 364 | 275 | **365** | **274** | 365 | 274 |
| 453.povray | 24 | 260 | 492 | **261** | **489** | 262 | 487 | 24 | 225 | 568 | **226** | **564** | 229 | 558 |
| 454.calculix | 24 | 425 | 466 | **424** | **467** | 423 | 468 | 24 | 424 | 467 | **423** | **468** | 422 | 469 |
| 459.GemsFDTD | 24 | 1126 | 226 | 1130 | 225 | **1126** | **226** | 12 | **554** | **230** | 555 | 229 | 553 | 230 |
| 465.tonto | 24 | 574 | 411 | **578** | **408** | 578 | 408 | 24 | **560** | **422** | 561 | 421 | 558 | 423 |
| 470.lbm | 24 | **763** | **432** | 763 | 432 | 762 | 433 | 24 | **763** | **432** | 763 | 432 | 762 | 433 |
| 481.wrf | 24 | 635 | 422 | **635** | **422** | 635 | 422 | 24 | **629** | **426** | 629 | 426 | 631 | 425 |
| 482.sphinx3 | 24 | 1284 | 364 | **1281** | **365** | 1280 | 365 | 24 | 1303 | 359 | 1300 | 360 | **1301** | **360** |

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:
Intel(R) Hyper-Threading Technology set to Enabled
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 speccpu-rhel6.2 Wed Apr  4 08:08:30 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 E5-2640 0 @ 2.50GHz
       2 "physical id"s (chips)
       24 "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 : 6
       siblings  : 12
       physical 0: cores 0 1 2 3 4 5
       physical 1: cores 0 1 2 3 4 5
    cache size : 15360 KB

 From /proc/meminfo
    MemTotal:       132101632 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-rhel6.2 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 Apr 4 08:02

 SPEC is set to: /opt/cpu2006-1.2
    Filesystem     Type    Size  Used Avail Use% Mounted on
    /dev/sda2      ext4    274G   10G  250G   4% /

 Additional information from dmidecode:
```

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## Platform Notes (Continued)

```
      Memory:
       16x 0xCE00 M393B1K70DH0-YK0 8 GB 1600 MHz 1 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 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
  459.GemsFDTD: -DSPEC_CPU_LP64
        465.tonto: -DSPEC_CPU_LP64
```

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## Base Portability Flags (Continued)

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

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## Peak Portability Flags (Continued)

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

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

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# Peak Optimization Flags (Continued)

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-linux64.20111122.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-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130607.xml


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