



# SPEC® CFP2006 Result

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## Cisco Systems

**SPECfp®\_rate2006 = 636**

Cisco UCS C460 M2 (Intel Xeon E7-4850, 2.00 GHz)

**SPECfp\_rate\_base2006 = 622**

CPU2006 license: 9019

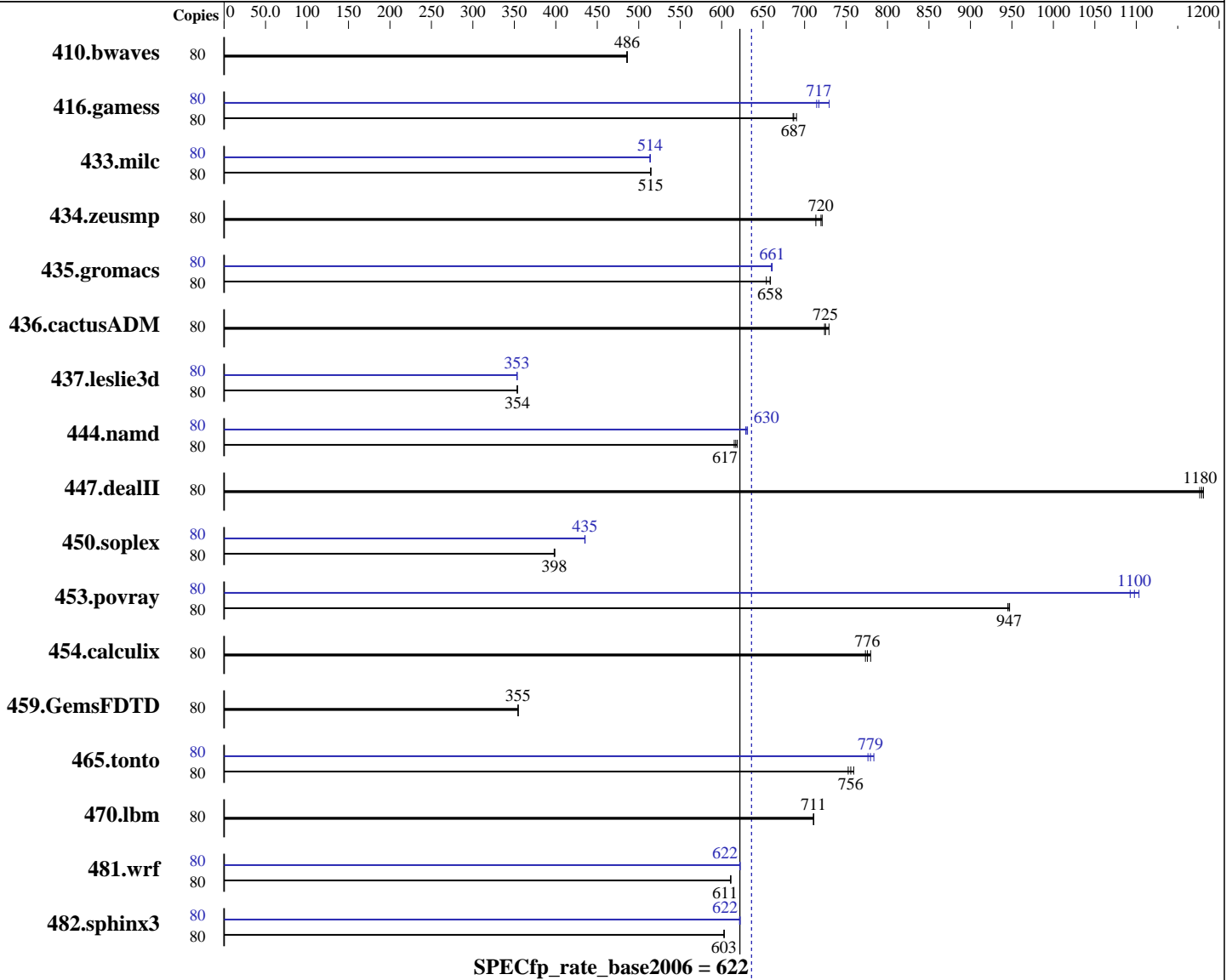
Test date: Jan-2012

Test sponsor: Cisco Systems

Hardware Availability: May-2011

Tested by: Cisco Systems

Software Availability: Oct-2011



### Hardware

CPU Name: Intel Xeon E7-4850  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.40 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 40 cores, 4 chips, 10 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

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### Software

Operating System: Red Hat Enterprise Linux Server release 6.1 (Santiago)  
 2.6.32-131.0.15.el6.x86\_64  
 Compiler: C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;  
 Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: ext4

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L3 Cache: 24 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 1 TB (64 x 16 GB 4Rx4 PC3-8500R-9, ECC)  
 Disk Subsystem: 600 GB SAS 10K RPM  
 Other Hardware: None

System State: Run level 3 (multi-user)  
 Base Pointers: 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    | 80     | 2239               | 486               | 2236               | 486               | <b><u>2236</u></b> | <b><u>486</u></b>  | 80     | 2239               | 486                | 2236               | 486               | <b><u>2236</u></b> | <b><u>486</u></b>  |
| 416.gamess    | 80     | 2283               | 686               | <b><u>2280</u></b> | <b><u>687</u></b> | 2269               | 690                | 80     | 2192               | 715                | 2147               | 730               | <b><u>2184</u></b> | <b><u>717</u></b>  |
| 433.milc      | 80     | 1427               | 515               | 1428               | 514               | <b><u>1427</u></b> | <b><u>515</u></b>  | 80     | <b><u>1429</u></b> | <b><u>514</u></b>  | 1430               | 514               | 1429               | 514                |
| 434.zeusmp    | 80     | 1020               | 714               | <b><u>1011</u></b> | <b><u>720</u></b> | 1009               | 721                | 80     | 1020               | 714                | <b><u>1011</u></b> | <b><u>720</u></b> | 1009               | 721                |
| 435.gromacs   | 80     | 867                | 659               | 874                | 654               | <b><u>868</u></b>  | <b><u>658</u></b>  | 80     | <b><u>865</u></b>  | <b><u>661</u></b>  | 864                | 661               | 865                | 660                |
| 436.cactusADM | 80     | <b><u>1318</u></b> | <b><u>725</u></b> | 1311               | 729               | 1320               | 724                | 80     | <b><u>1318</u></b> | <b><u>725</u></b>  | 1311               | 729               | 1320               | 724                |
| 437.leslie3d  | 80     | 2126               | 354               | <b><u>2127</u></b> | <b><u>354</u></b> | 2128               | 353                | 80     | 2129               | 353                | 2128               | 353               | <b><u>2129</u></b> | <b><u>353</u></b>  |
| 444.namd      | 80     | <b><u>1040</u></b> | <b><u>617</u></b> | 1037               | 619               | 1043               | 615                | 80     | 1016               | 631                | <b><u>1019</u></b> | <b><u>630</u></b> | 1020               | 629                |
| 447.dealII    | 80     | 775                | 1180              | 778                | 1180              | <b><u>776</u></b>  | <b><u>1180</u></b> | 80     | 775                | 1180               | 778                | 1180              | <b><u>776</u></b>  | <b><u>1180</u></b> |
| 450.soplex    | 80     | <b><u>1675</u></b> | <b><u>398</u></b> | 1673               | 399               | 1676               | 398                | 80     | 1534               | 435                | 1532               | 435               | <b><u>1534</u></b> | <b><u>435</u></b>  |
| 453.povray    | 80     | 450                | 945               | 449                | 947               | <b><u>450</u></b>  | <b><u>947</u></b>  | 80     | <b><u>388</u></b>  | <b><u>1100</u></b> | 390                | 1090              | 386                | 1100               |
| 454.calculix  | 80     | 847                | 780               | 853                | 773               | <b><u>851</u></b>  | <b><u>776</u></b>  | 80     | 847                | 780                | 853                | 773               | <b><u>851</u></b>  | <b><u>776</u></b>  |
| 459.GemsFDTD  | 80     | 2395               | 354               | 2393               | 355               | <b><u>2394</u></b> | <b><u>355</u></b>  | 80     | 2395               | 354                | 2393               | 355               | <b><u>2394</u></b> | <b><u>355</u></b>  |
| 465.tonto     | 80     | 1037               | 759               | 1046               | 753               | <b><u>1042</u></b> | <b><u>756</u></b>  | 80     | 1005               | 784                | <b><u>1010</u></b> | <b><u>779</u></b> | 1014               | 776                |
| 470.lbm       | 80     | <b><u>1546</u></b> | <b><u>711</u></b> | 1547               | 711               | 1546               | 711                | 80     | <b><u>1546</u></b> | <b><u>711</u></b>  | 1547               | 711               | 1546               | 711                |
| 481.wrf       | 80     | <b><u>1463</u></b> | <b><u>611</u></b> | 1462               | 611               | 1463               | 611                | 80     | <b><u>1436</u></b> | <b><u>622</u></b>  | 1436               | 622               | 1437               | 622                |
| 482.sphinx3   | 80     | 2587               | 603               | 2585               | 603               | <b><u>2586</u></b> | <b><u>603</u></b>  | 80     | <b><u>2506</u></b> | <b><u>622</u></b>  | 2506               | 622               | 2508               | 622                |

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

Sysinfo program /opt/cpu2006/config/sysinfo.rev6800  
\$Rev: 6800 \$ \$Date:: 2011-10-11 #\$ 6f2ebdff5032aaa42e583f96b07f99d3  
running on localhost.localdomain Wed Jan 11 15:00:26 2012

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## Platform Notes (Continued)

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 E7- 4850 @ 2.00GHz
4 "physical id"s (chips)
80 "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 : 10
siblings : 20
physical 0: cores 0 1 2 8 9 16 17 18 24 25
physical 1: cores 0 1 2 8 9 16 17 18 24 25
physical 2: cores 0 1 2 8 9 16 17 18 24 25
physical 3: cores 0 1 2 8 9 16 17 18 24 25
```

cache size : 24576 KB

From /proc/meminfo

```
MemTotal: 1058714448 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

/usr/bin/lsb\_release -d

```
Red Hat Enterprise Linux Server release 6.1 (Santiago)
```

From /etc/\*release\* /etc/\*version\*

```
redhat-release: Red Hat Enterprise Linux Server release 6.1 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.1 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

uname -a:

```
Linux localhost.localdomain 2.6.32-131.0.15.el6.x86_64 #1 SMP Tue May 10
15:42:40 EDT 2011 x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Jan 11 14:05

SPEC is set to: /opt/cpu2006

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdal ext4 550G 5.8G 516G 2% /
```

Additional information from dmidecode:

(End of data from sysinfo program)



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## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/opt/cpu2006/libs/32:/opt/cpu2006/libs/64"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5  
Transparent Huge Pages disabled with:  
echo never > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled  
Filesystem page cache cleared with:  
echo 1 > /proc/sys/vm/drop\_caches  
runspec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>

## 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.deallI: -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  
470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
482.sphinx3: -DSPEC\_CPU\_LP64



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## Base Optimization Flags

C benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

Benchmarks using both Fortran and C:

-xSSE4.2 -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.deallI: -DSPEC\_CPU\_LP64  
453.povray: -DSPEC\_CPU\_LP64

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Tested by: Cisco Systems

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## Peak Portability Flags (Continued)

454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main  
 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

## Peak Optimization Flags

C benchmarks:

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

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3  
 -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealIII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(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: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

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## Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

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

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32

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.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.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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