



# SPEC® CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp®\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

CPU2006 license: 9019

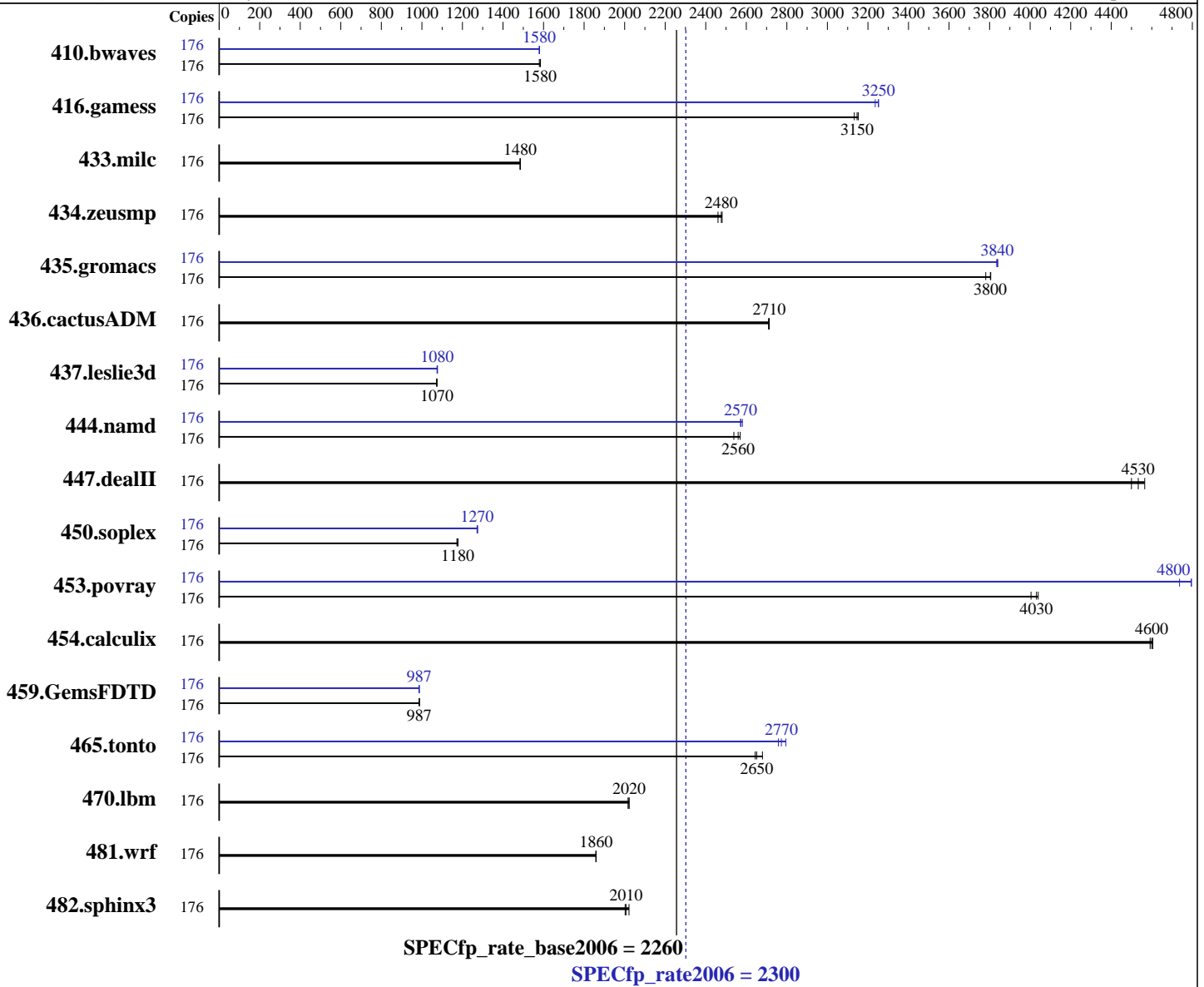
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Apr-2017

Hardware Availability: Apr-2016

Software Availability: Sep-2016



### Hardware

CPU Name: Intel Xeon E7-8880 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 88 cores, 4 chips, 22 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 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: SUSE Linux Enterprise Server 12 SP1 (x86\_64) 3.12.49-11-default  
 Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux  
 Auto Parallel: No  
 File System: xfs  
 System State: Run level 3 (multi-user)

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Apr-2017

Hardware Availability: Apr-2016

Software Availability: Sep-2016

L3 Cache: 55 MB I+D on chip per chip  
Other Cache: None  
Memory: 1 TB (32 x 32 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
Disk Subsystem: 1 x 400 GB SAS SSD  
Other Hardware: None

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    | 176    | <u>1511</u> | <u>1580</u> | 1509        | 1580        | 1515        | 1580        | 176    | <u>1514</u> | <u>1580</u> | 1514        | 1580        | 1515        | 1580        |
| 416.gamess    | 176    | <u>1095</u> | <u>3150</u> | 1093        | 3150        | 1100        | 3130        | 176    | 1065        | 3240        | 1060        | 3250        | <u>1060</u> | <u>3250</u> |
| 433.milc      | 176    | <u>1088</u> | <u>1480</u> | 1088        | 1480        | 1088        | 1490        | 176    | <u>1088</u> | <u>1480</u> | 1088        | 1480        | 1088        | 1490        |
| 434.zeusmp    | 176    | 646         | 2480        | <u>647</u>  | <u>2480</u> | 651         | 2460        | 176    | 646         | 2480        | <u>647</u>  | <u>2480</u> | 651         | 2460        |
| 435.gromacs   | 176    | 332         | 3780        | 330         | 3810        | <u>330</u>  | <u>3800</u> | 176    | <u>327</u>  | <u>3840</u> | 327         | 3840        | 328         | 3830        |
| 436.cactusADM | 176    | <u>775</u>  | <u>2710</u> | 775         | 2710        | 776         | 2710        | 176    | <u>775</u>  | <u>2710</u> | 775         | 2710        | 776         | 2710        |
| 437.leslie3d  | 176    | 1540        | 1070        | 1543        | 1070        | <u>1540</u> | <u>1070</u> | 176    | 1536        | 1080        | 1540        | 1070        | <u>1537</u> | <u>1080</u> |
| 444.namd      | 176    | 549         | 2570        | 556         | 2540        | <u>551</u>  | <u>2560</u> | 176    | 549         | 2570        | 547         | 2580        | <u>549</u>  | <u>2570</u> |
| 447.dealII    | 176    | <u>444</u>  | <u>4530</u> | 441         | 4570        | 447         | 4500        | 176    | <u>444</u>  | <u>4530</u> | 441         | 4570        | 447         | 4500        |
| 450.soplex    | 176    | <u>1248</u> | <u>1180</u> | 1252        | 1170        | 1246        | 1180        | 176    | <u>1153</u> | <u>1270</u> | 1154        | 1270        | 1151        | 1280        |
| 453.povray    | 176    | <u>232</u>  | <u>4030</u> | 232         | 4040        | 234         | 4000        | 176    | 195         | 4800        | 198         | 4740        | <u>195</u>  | <u>4800</u> |
| 454.calculix  | 176    | 315         | 4600        | 316         | 4590        | <u>316</u>  | <u>4600</u> | 176    | 315         | 4600        | 316         | 4590        | <u>316</u>  | <u>4600</u> |
| 459.GemsFDTD  | 176    | 1891        | 988         | <u>1891</u> | <u>987</u>  | 1892        | 987         | 176    | 1894        | 986         | 1892        | 987         | <u>1892</u> | <u>987</u>  |
| 465.tonto     | 176    | 646         | 2680        | 655         | 2640        | <u>653</u>  | <u>2650</u> | 176    | 628         | 2760        | <u>625</u>  | <u>2770</u> | 620         | 2790        |
| 470.lbm       | 176    | <u>1196</u> | <u>2020</u> | 1199        | 2020        | 1196        | 2020        | 176    | <u>1196</u> | <u>2020</u> | 1199        | 2020        | 1196        | 2020        |
| 481.wrf       | 176    | 1058        | 1860        | <u>1057</u> | <u>1860</u> | 1057        | 1860        | 176    | 1058        | 1860        | <u>1057</u> | <u>1860</u> | 1057        | 1860        |
| 482.sphinx3   | 176    | 1713        | 2000        | <u>1709</u> | <u>2010</u> | 1697        | 2020        | 176    | 1713        | 2000        | <u>1709</u> | <u>2010</u> | 1697        | 2020        |

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"



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

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

**Test date:** Apr-2017  
**Hardware Availability:** Apr-2016  
**Software Availability:** Sep-2016

### Platform Notes

#### BIOS Settings:

CPU performance set to Enterprise  
Power Technology set to Energy Efficient  
Energy Performance set to Balanced Performance  
Memory RAS configuration set to Maximum Performance  
Memory Power Saving Mode set to Disabled  
QPI Snoop Mode set to Cluster-on-Die  
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on linux-3y2r Tue Apr 18 02:11:12 2017

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 E7-8880 v4 @ 2.20GHz
 4 "physical id"s (chips)
 176 "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 : 22
siblings : 44
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
28
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
28
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
28
cache size : 28160 KB
```

#### From /proc/meminfo

```
MemTotal: 1058495376 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

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

```
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
# This file is deprecated and will be removed in a future service pack or
release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

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

Test date: Apr-2017  
Hardware Availability: Apr-2016  
Software Availability: Sep-2016

### Platform Notes (Continued)

```
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

```
uname -a:
Linux linux-3y2r 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Jan 1 07:26
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda1       xfs   373G   19G  354G   6% /
```

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Cisco Systems, Inc. EXM4.3.1.2c.0.080220161434 08/02/2016

Memory:  
32x 0xCE00 M393A4K40BB0-CPB 32 GB 2 rank 2133 MHz, configured at 1600 MHz  
64x NO DIMM NO DIMM 2400 MHz

(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:/opt/cpu2006-1.2/sh10.2"
```

Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

Transparent Huge Pages enabled with:

```
echo always > /sys/kernel/mm/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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Apr-2017

Hardware Availability: Apr-2016

Software Availability: Sep-2016

## Base Compiler Invocation (Continued)

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  
 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:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32  
-qopt-mem-layout-trans=3

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32  
-qopt-mem-layout-trans=3

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32  
-qopt-mem-layout-trans=3



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Apr-2017

Hardware Availability: Apr-2016

Software Availability: Sep-2016

## Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers\_and\_libraries\_2017/linux/lib/ia32

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  
 450.soplex: -D\_FILE\_OFFSET\_BITS=64  
 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

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Apr-2017

Hardware Availability: Apr-2016

Software Availability: Sep-2016

## Peak Optimization Flags (Continued)

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -fno-alias -auto-ilp32  
-qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -qopt-malloc-options=3  
-qopt-mem-layout-trans=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3

### Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll4 -auto -inline-calloc  
-qopt-malloc-options=3

### Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32  
-qopt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon E7-8880 v4 2.20 GHz)

SPECfp\_rate2006 = 2300

SPECfp\_rate\_base2006 = 2260

**CPU2006 license:** 9019

**Test sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**Test date:** Apr-2017

**Hardware Availability:** Apr-2016

**Software Availability:** Sep-2016

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revD.20170404.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revD.20170404.xml>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Wed May 31 12:00:13 2017 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 31 May 2017.