



# SPEC<sup>®</sup> CFP2006 Result

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## Cisco Systems

Cisco UCS C240 M3 (Intel Xeon E5-2670 v2, 2.50 GHz)

**SPECfp<sup>®</sup>2006 = 89.6**

**SPECfp\_base2006 = 86.5**

CPU2006 license: 9019

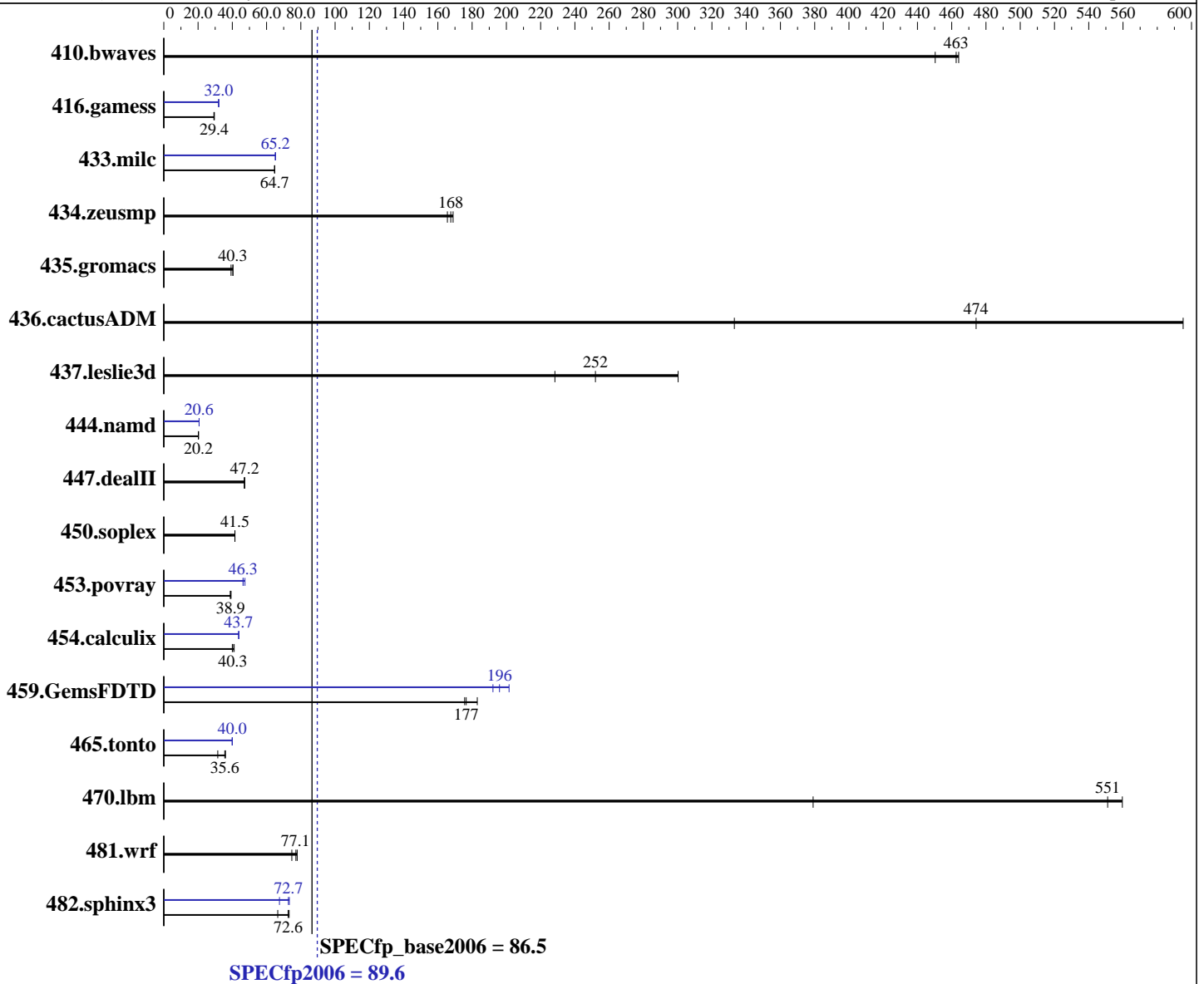
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Dec-2013

Hardware Availability: Dec-2013

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E5-2670 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip  
 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 6.4 (Santiago)  
 2.6.32-358.el6.x86\_64  
 Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;  
 Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 25 MB I+D on chip per chip  
Other Cache: None  
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-14900R-13, ECC)  
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					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<b><u>29.4</u></b>	<b><u>463</u></b>	29.3	464	30.2	450	<b><u>29.4</u></b>	<b><u>463</u></b>	29.3	464	30.2	450
416.gamess	670	29.2	663	29.5	<b><u>667</u></b>	<b><u>29.4</u></b>	<b><u>611</u></b>	<b><u>32.0</u></b>	611	32.0	612	32.0
433.milc	142	64.7	142	64.7	<b><u>142</u></b>	<b><u>64.7</u></b>	<b><u>141</u></b>	<b><u>65.2</u></b>	141	65.1	141	65.3
434.zeusmp	53.9	169	<b><u>54.3</u></b>	<b><u>168</u></b>	55.0	166	53.9	169	<b><u>54.3</u></b>	<b><u>168</u></b>	55.0	166
435.gromacs	182	39.3	<b><u>177</u></b>	<b><u>40.3</u></b>	177	40.3	182	39.3	<b><u>177</u></b>	<b><u>40.3</u></b>	177	40.3
436.cactusADM	20.1	595	35.9	333	<b><u>25.2</u></b>	<b><u>474</u></b>	20.1	595	35.9	333	<b><u>25.2</u></b>	<b><u>474</u></b>
437.leslie3d	31.3	300	<b><u>37.3</u></b>	<b><u>252</u></b>	41.2	228	31.3	300	<b><u>37.3</u></b>	<b><u>252</u></b>	41.2	228
444.namd	<b><u>397</u></b>	<b><u>20.2</u></b>	397	20.2	397	20.2	389	20.6	<b><u>389</u></b>	<b><u>20.6</u></b>	389	20.6
447.dealII	<b><u>242</u></b>	<b><u>47.2</u></b>	242	47.2	243	47.0	<b><u>242</u></b>	<b><u>47.2</u></b>	242	47.2	243	47.0
450.soplex	201	41.5	201	41.5	<b><u>201</u></b>	<b><u>41.5</u></b>	201	41.5	201	41.5	<b><u>201</u></b>	<b><u>41.5</u></b>
453.povray	137	38.9	<b><u>137</u></b>	<b><u>38.9</u></b>	135	39.3	112	47.4	115	46.3	<b><u>115</u></b>	<b><u>46.3</u></b>
454.calculix	<b><u>205</u></b>	<b><u>40.3</u></b>	206	40.0	201	41.1	189	43.8	189	43.7	<b><u>189</u></b>	<b><u>43.7</u></b>
459.GemsFDTD	<b><u>60.1</u></b>	<b><u>177</u></b>	60.4	176	58.0	183	55.2	192	<b><u>54.1</u></b>	<b><u>196</u></b>	52.6	202
465.tonto	273	36.0	<b><u>276</u></b>	<b><u>35.6</u></b>	312	31.5	246	39.9	246	40.0	<b><u>246</u></b>	<b><u>40.0</u></b>
470.lbm	<b><u>24.9</u></b>	<b><u>551</u></b>	24.6	560	36.2	379	<b><u>24.9</u></b>	<b><u>551</u></b>	24.6	560	36.2	379
481.wrf	<b><u>145</u></b>	<b><u>77.1</u></b>	143	77.9	149	74.7	<b><u>145</u></b>	<b><u>77.1</u></b>	143	77.9	149	74.7
482.sphinx3	<b><u>269</u></b>	<b><u>72.6</u></b>	266	73.2	293	66.5	289	67.5	266	73.3	<b><u>268</u></b>	<b><u>72.7</u></b>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

## Platform Notes

BIOS Settings:  
Intel HT Technology = Disabled  
CPU performance set to HPC  
Power Technology set to Custom  
CPU Power State C6 set to Enabled  
CPU Power State C1 Enhanced set to Disabled  
Energy Performance policy set to Performance  
Memory RAS configuration set to Maximum Performance  
DRAM Clock Throttling Set to Performance  
LV DDR Mode set to Performance-mode

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### Platform Notes (Continued)

DRAM Refresh Rate Set to 1x  
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 # \$ e86d102572650a6e4d596a3cee98f191  
running on C240M3-ivb Mon Dec 23 15:33:31 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 E5-2670 v2 @ 2.50GHz
 2 "physical id"s (chips)
 20 "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  : 10
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12
cache size : 25600 KB
```

```
From /proc/meminfo
MemTotal:      132125724 kB
HugePages_Total:    0
Hugepagesize:    2048 kB
```

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.4 (Santiago)
```

```
From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
Linux C240M3-ivb 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Dec 23 15:32
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sdal       ext4      275G  49G  212G  19% /
```

```
Additional information from dmidecode:
BIOS Cisco Systems, Inc. C240M3.1.5.3b.0.082020130616 08/20/2013
Memory:
 16x 0xAD00 HMT31GR7EFR4C-RD 8 GB 1866 MHz 2 rank
 8x NO DIMM NO DIMM
```

(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/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"
OMP_NUM_THREADS = "20"
```

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4

Transparent Huge Pages enabled with:

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

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.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
```



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## Base Optimization Flags

C benchmarks:

`-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias`

C++ benchmarks:

`-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias`

Fortran benchmarks:

`-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch`

Benchmarks using both Fortran and C:

`-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias`

## Peak Compiler Invocation

C benchmarks:

`icc -m64`

C++ benchmarks:

`icpc -m64`

Fortran benchmarks:

`ifort -m64`

Benchmarks using both Fortran and C:

`icc -m64 ifort -m64`

## Peak Portability Flags

Same as Base Portability Flags

## 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) -auto-ilp32  
-ansi-alias`

470.lbm: `basepeak = yes`

482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel`

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## Peak Optimization Flags (Continued)

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.dealIII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -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 -opt-prefetch -parallel

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc  
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

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

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130717.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130717.xml>



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