



# SPEC® CFP2006 Result

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## Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8890 v4 2.20 GHz)

**SPECfp®2006 = 126**

**SPECfp\_base2006 = 118**

CPU2006 license: 9019

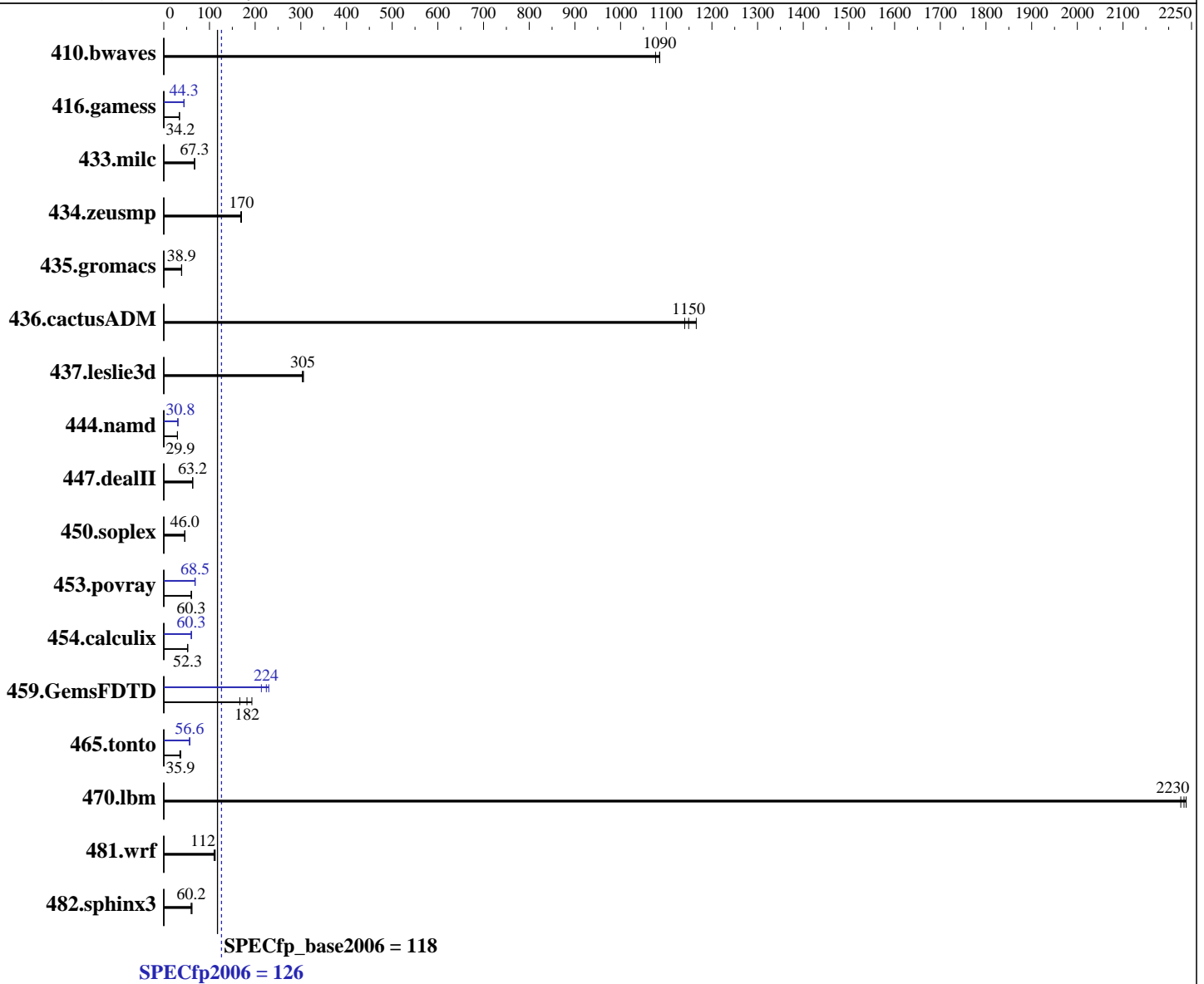
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Nov-2016

Hardware Availability: Jul-2016

Software Availability: Dec-2015



Hardware	Software
CPU Name: Intel Xeon E7-8890 v4	Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64) 3.12.49-11-default
CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz	Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
CPU MHz: 2200	Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
FPU: Integrated	Auto Parallel: Yes
CPU(s) enabled: 96 cores, 4 chips, 24 cores/chip	File System: xfs
CPU(s) orderable: 2,4 chips	System State: Run level 3 (multi-user)
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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L3 Cache: 60 MB I+D on chip per chip  
Other Cache: None  
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)  
Disk Subsystem: 1 x 400 GB SAS SSD  
Other Hardware: None

Base Pointers: 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	12.5	1090	<b><u>12.5</u></b>	<b><u>1090</u></b>	12.6	1080	12.5	1090	<b><u>12.5</u></b>	<b><u>1090</u></b>	12.6	1080
416.gamess	572	34.2	<b><u>573</u></b>	<b><u>34.2</u></b>	574	34.1	442	44.3	444	44.1	<b><u>442</u></b>	<b><u>44.3</u></b>
433.milc	137	67.2	<b><u>136</u></b>	<b><u>67.3</u></b>	136	67.6	137	67.2	<b><u>136</u></b>	<b><u>67.3</u></b>	136	67.6
434.zeusmp	53.5	170	54.1	168	<b><u>53.5</u></b>	<b><u>170</u></b>	53.5	170	54.1	168	<b><u>53.5</u></b>	<b><u>170</u></b>
435.gromacs	<b><u>183</u></b>	<b><u>38.9</u></b>	182	39.3	184	38.9	<b><u>183</u></b>	<b><u>38.9</u></b>	182	39.3	184	38.9
436.cactusADM	10.5	1140	10.3	1170	<b><u>10.4</u></b>	<b><u>1150</u></b>	10.5	1140	10.3	1170	<b><u>10.4</u></b>	<b><u>1150</u></b>
437.leslie3d	<b><u>30.9</u></b>	<b><u>305</u></b>	31.0	303	30.7	306	<b><u>30.9</u></b>	<b><u>305</u></b>	31.0	303	30.7	306
444.namd	268	29.9	<b><u>268</u></b>	<b><u>29.9</u></b>	268	29.9	260	30.8	<b><u>260</u></b>	<b><u>30.8</u></b>	260	30.8
447.dealII	181	63.2	<b><u>181</u></b>	<b><u>63.2</u></b>	181	63.3	181	63.2	<b><u>181</u></b>	<b><u>63.2</u></b>	181	63.3
450.soplex	181	46.0	181	46.0	<b><u>181</u></b>	<b><u>46.0</u></b>	181	46.0	181	46.0	<b><u>181</u></b>	<b><u>46.0</u></b>
453.povray	<b><u>88.2</u></b>	<b><u>60.3</u></b>	87.5	60.8	88.7	60.0	78.0	68.2	77.4	68.7	<b><u>77.7</u></b>	<b><u>68.5</u></b>
454.calculix	<b><u>158</u></b>	<b><u>52.3</u></b>	157	52.5	159	51.8	137	60.3	137	60.2	<b><u>137</u></b>	<b><u>60.3</u></b>
459.GemsFDTD	55.0	193	63.8	166	<b><u>58.3</u></b>	<b><u>182</u></b>	46.2	230	<b><u>47.3</u></b>	<b><u>224</u></b>	49.7	214
465.tonto	280	35.2	<b><u>274</u></b>	<b><u>35.9</u></b>	265	37.1	174	56.4	174	56.7	<b><u>174</u></b>	<b><u>56.6</u></b>
470.lbm	<b><u>6.15</u></b>	<b><u>2230</u></b>	6.14	2240	6.17	2230	<b><u>6.15</u></b>	<b><u>2230</u></b>	6.14	2240	6.17	2230
481.wrf	99.4	112	<b><u>99.6</u></b>	<b><u>112</u></b>	102	110	99.4	112	<b><u>99.6</u></b>	<b><u>112</u></b>	102	110
482.sphinx3	315	61.9	<b><u>324</u></b>	<b><u>60.2</u></b>	324	60.1	315	61.9	<b><u>324</u></b>	<b><u>60.2</u></b>	324	60.1

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 Hyper-Threading Technology option set to Disabled

CPU performance set to Enterprise

Power Technology set to Energy Efficient

Energy Performance BIAS setting set to Balanced Performance

Memory RAS configuration set to Maximum Performance

Memory Power Saving Mode set to Disabled

QPI Snoop Mode set to Home Directory Snoop with OSB

Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6914

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**SPECfp\_base2006 = 118**

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

**Test date:** Nov-2016  
**Hardware Availability:** Jul-2016  
**Software Availability:** Dec-2015

### Platform Notes (Continued)

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on linux-69f9 Thu Nov 10 19:50:18 2016

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 E7-8890 v4 @ 2.20GHz
 4 "physical id"s (chips)
 96 "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 : 24
  siblings  : 24
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
  physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
  physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
 27 28 29
cache size : 61440 KB
```

```
From /proc/meminfo
MemTotal:      529296036 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"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

```
uname -a:
Linux linux-69f9 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

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## Platform Notes (Continued)

run-level 3 Nov 10 05:04

SPEC is set to: /opt/cpu2006-1.2

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sdal	xfs	372G	42G	331G	12%	/

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. C460M4.2.0.13b.0.080320162321 08/03/2016

Memory:

32x 0xCE00 M393A2G40EB1-CRC 16 GB 2 rank 2400 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:

KMP\_AFFINITY = "granularity=fine,compact"

LD\_LIBRARY\_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"

OMP\_NUM\_THREADS = "96"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

## 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

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## Base Portability Flags (Continued)

```

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 -parallel -opt-prefetch
-ansi-alias

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

```

Fortran benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

```

Benchmarks using both Fortran and C:

```

-xCORE-AVX2 -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

```



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## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4  
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc

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## Peak Optimization Flags (Continued)

465.tonto (continued):

`-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: `-xCORE-AVX2 -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-ic16.0-official-linux64.html>

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

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

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

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

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

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