



# SPEC<sup>®</sup> CFP2006 Result

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## Cisco Systems

Cisco UCS B200 M4 (Intel Xeon E5-2640 v4, 2.40 GHz)

**SPECfp<sup>®</sup>2006 = 118**

**SPECfp\_base2006 = 111**

CPU2006 license: 9019

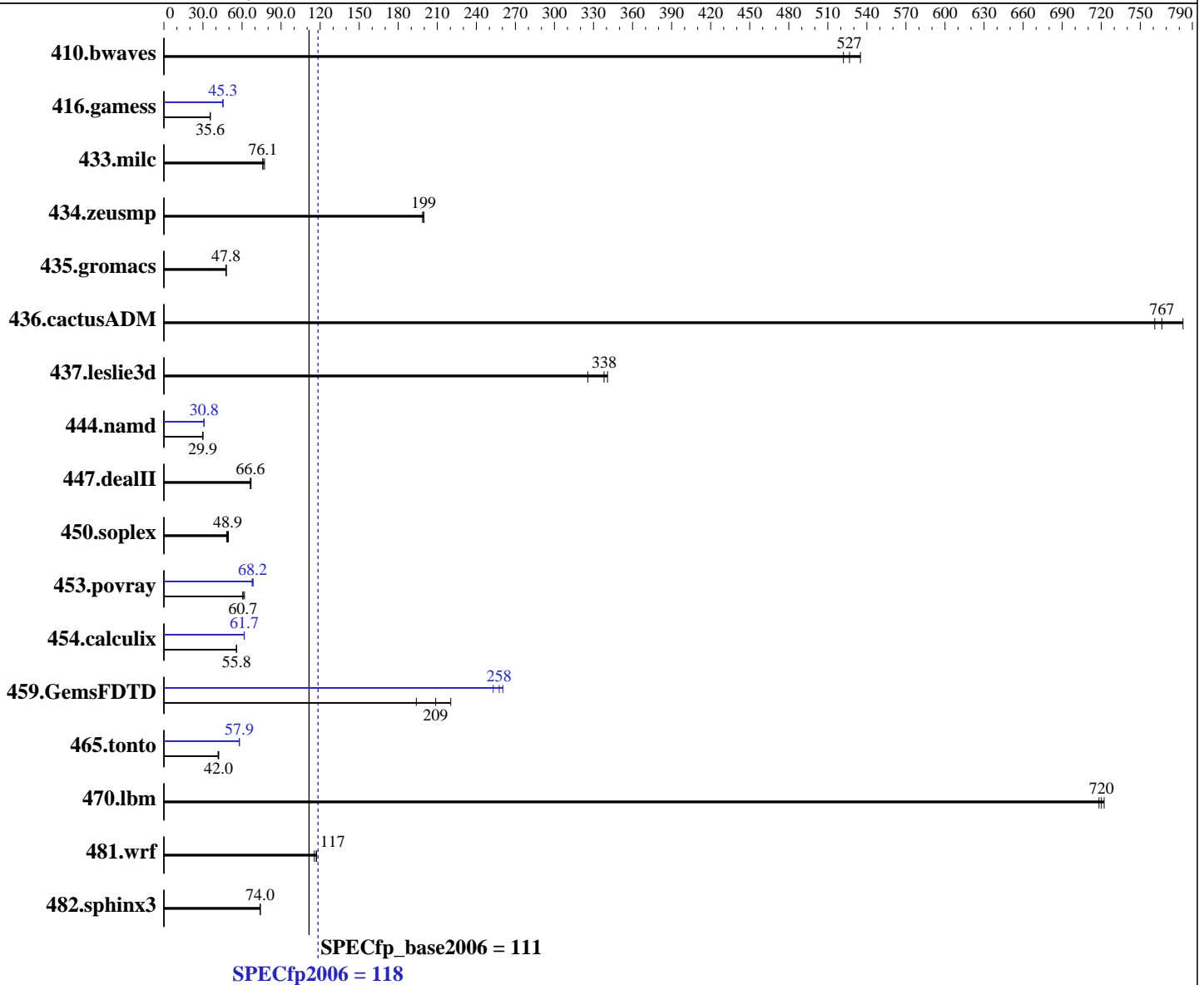
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: May-2016

Hardware Availability: Apr-2016

Software Availability: Dec-2015



**Hardware**

CPU Name: Intel Xeon E5-2640 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip  
 CPU(s) orderable: 1,2 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: SUSE Linux Enterprise Server 12 SP1 (x86\_64) 3.12.49-11-default  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 25 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)  
Disk Subsystem: 1 x 400 GB SSD SAS  
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	26.0	522	25.4	535	<b><u>25.8</u></b>	<b><u>527</u></b>	26.0	522	25.4	535	<b><u>25.8</u></b>	<b><u>527</u></b>
416.gamess	<b><u>550</u></b>	<b><u>35.6</u></b>	551	35.6	550	35.6	432	45.4	<b><u>432</u></b>	<b><u>45.3</u></b>	433	45.3
433.milc	<b><u>121</u></b>	<b><u>76.1</u></b>	121	75.9	119	77.3	<b><u>121</u></b>	<b><u>76.1</u></b>	121	75.9	119	77.3
434.zeusmp	45.8	199	45.6	200	<b><u>45.6</u></b>	<b><u>199</u></b>	45.8	199	45.6	200	<b><u>45.6</u></b>	<b><u>199</u></b>
435.gromacs	149	47.9	149	47.8	<b><u>149</u></b>	<b><u>47.8</u></b>	149	47.9	149	47.8	<b><u>149</u></b>	<b><u>47.8</u></b>
436.cactusADM	<b><u>15.6</u></b>	<b><u>767</u></b>	15.7	761	15.3	783	<b><u>15.6</u></b>	<b><u>767</u></b>	15.7	761	15.3	783
437.leslie3d	27.6	341	<b><u>27.8</u></b>	<b><u>338</u></b>	28.9	326	27.6	341	<b><u>27.8</u></b>	<b><u>338</u></b>	28.9	326
444.namd	268	29.9	<b><u>268</u></b>	<b><u>29.9</u></b>	268	29.9	<b><u>260</u></b>	<b><u>30.8</u></b>	260	30.8	260	30.8
447.dealII	<b><u>172</u></b>	<b><u>66.6</u></b>	172	66.4	171	66.9	<b><u>172</u></b>	<b><u>66.6</u></b>	172	66.4	171	66.9
450.soplex	168	49.5	173	48.3	<b><u>171</u></b>	<b><u>48.9</u></b>	168	49.5	173	48.3	<b><u>171</u></b>	<b><u>48.9</u></b>
453.povray	<b><u>87.6</u></b>	<b><u>60.7</u></b>	87.8	60.6	86.0	61.9	77.6	68.5	78.6	67.7	<b><u>78.0</u></b>	<b><u>68.2</u></b>
454.calculix	148	55.8	<b><u>148</u></b>	<b><u>55.8</u></b>	148	55.8	<b><u>134</u></b>	<b><u>61.7</u></b>	134	61.8	134	61.6
459.GemsFDTD	48.2	220	54.7	194	<b><u>50.8</u></b>	<b><u>209</u></b>	<b><u>41.2</u></b>	<b><u>258</u></b>	41.9	253	40.7	260
465.tonto	234	42.1	<b><u>234</u></b>	<b><u>42.0</u></b>	237	41.6	169	58.1	<b><u>170</u></b>	<b><u>57.9</u></b>	170	57.9
470.lbm	<b><u>19.1</u></b>	<b><u>720</u></b>	19.0	722	19.1	718	<b><u>19.1</u></b>	<b><u>720</u></b>	19.0	722	19.1	718
481.wrf	95.2	117	96.7	116	<b><u>95.5</u></b>	<b><u>117</u></b>	95.2	117	96.7	116	<b><u>95.5</u></b>	<b><u>117</u></b>
482.sphinx3	<b><u>263</u></b>	<b><u>74.0</u></b>	264	73.9	263	74.0	<b><u>263</u></b>	<b><u>74.0</u></b>	264	73.9	263	74.0

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/CISCO\_Benchmarks/cpu2006/config/sysinfo.rev6914

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CPU2006 license: 9019

Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: May-2016

Hardware Availability: Apr-2016

Software Availability: Dec-2015

### Platform Notes (Continued)

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on linux-nsg9 Fri May 27 05:51:12 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 E5-2640 v4 @ 2.40GHz

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: 264369996 kB

HugePages\_Total: 0

Hugepagesize: 2048 kB

/usr/bin/lsb\_release -d

SUSE Linux Enterprise Server 12 SP1

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-nsg9 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 May 27 00:43

SPEC is set to: /opt/CISCO\_Benchmarks/cpu2006

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### Platform Notes (Continued)

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sdal	xfs	325G	15G	311G	5%	/

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. B200M4.3.1.2.4.041120161047 04/11/2016

Memory:

16x 0xCE00 M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 MHz  
8x NO DIMM NO DIMM

(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/CISCO\_Benchmarks/cpu2006/libs/32:/opt/CISCO\_Benchmarks/cpu2006/libs/64:/opt/CISCO\_Benchmarks/cpu2006/sh"

OMP\_NUM\_THREADS = "20"

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

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent\_hugepage/enabled

### 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

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## Base 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
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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