



# SPEC® CFP2006 Result

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## Cisco Systems

Cisco UCS B460 M4 (Intel Xeon CPU E7-8893 v4 3.20 GHz)

**SPECfp®2006 = 121**

**SPECfp\_base2006 = 116**

CPU2006 license: 9019

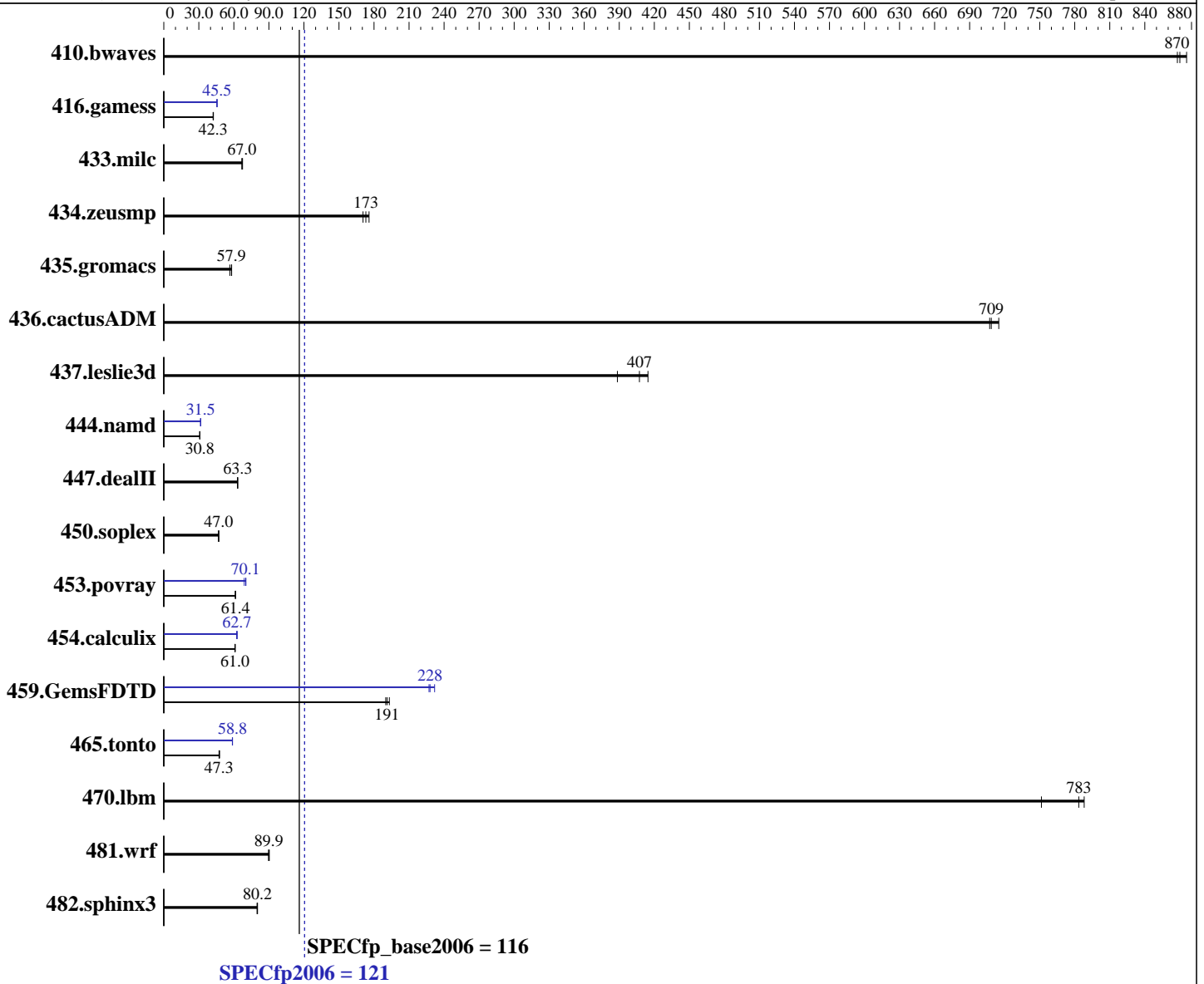
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Apr-2017

Hardware Availability: Apr-2016

Software Availability: Sep-2016



### Hardware

CPU Name: Intel Xeon E7-8893 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz  
 CPU MHz: 3200  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 4 chips, 4 cores/chip  
 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

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### 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: Yes  
 File System: xfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 60 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: 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	15.7	868	15.5	876	<b><u>15.6</u></b>	<b><u>870</u></b>	15.7	868	15.5	876	<b><u>15.6</u></b>	<b><u>870</u></b>
416.gamess	<b><u>463</u></b>	<b><u>42.3</u></b>	464	42.2	461	42.5	<b><u>430</u></b>	<b><u>45.5</u></b>	430	45.6	430	45.5
433.milc	<b><u>137</u></b>	<b><u>67.0</u></b>	136	67.4	137	66.9	<b><u>137</u></b>	<b><u>67.0</u></b>	136	67.4	137	66.9
434.zeusmp	53.3	171	<b><u>52.6</u></b>	<b><u>173</u></b>	51.8	176	53.3	171	<b><u>52.6</u></b>	<b><u>173</u></b>	51.8	176
435.gromacs	126	56.5	123	58.1	<b><u>123</u></b>	<b><u>57.9</u></b>	126	56.5	123	58.1	<b><u>123</u></b>	<b><u>57.9</u></b>
436.cactusADM	<b><u>16.9</u></b>	<b><u>709</u></b>	16.9	707	16.7	715	<b><u>16.9</u></b>	<b><u>709</u></b>	16.9	707	16.7	715
437.leslie3d	22.7	415	<b><u>23.1</u></b>	<b><u>407</u></b>	24.2	388	22.7	415	<b><u>23.1</u></b>	<b><u>407</u></b>	24.2	388
444.namd	260	30.8	260	30.9	<b><u>260</u></b>	<b><u>30.8</u></b>	<b><u>254</u></b>	<b><u>31.5</u></b>	254	31.5	254	31.5
447.dealII	181	63.0	181	63.3	<b><u>181</u></b>	<b><u>63.3</u></b>	181	63.0	181	63.3	<b><u>181</u></b>	<b><u>63.3</u></b>
450.soplex	178	46.9	<b><u>177</u></b>	<b><u>47.0</u></b>	177	47.0	178	46.9	<b><u>177</u></b>	<b><u>47.0</u></b>	177	47.0
453.povray	86.5	61.5	<b><u>86.6</u></b>	<b><u>61.4</u></b>	87.0	61.2	<b><u>75.9</u></b>	<b><u>70.1</u></b>	75.7	70.3	77.2	68.9
454.calculix	<b><u>135</u></b>	<b><u>61.0</u></b>	135	60.9	135	61.1	131	62.8	132	62.4	<b><u>132</u></b>	<b><u>62.7</u></b>
459.GemsFDTD	54.9	193	55.8	190	<b><u>55.5</u></b>	<b><u>191</u></b>	46.7	227	<b><u>46.5</u></b>	<b><u>228</u></b>	45.8	232
465.tonto	208	47.3	<b><u>208</u></b>	<b><u>47.3</u></b>	206	47.8	168	58.7	167	58.8	<b><u>167</u></b>	<b><u>58.8</u></b>
470.lbm	<b><u>17.5</u></b>	<b><u>783</u></b>	17.4	788	18.3	751	<b><u>17.5</u></b>	<b><u>783</u></b>	17.4	788	18.3	751
481.wrf	125	89.7	<b><u>124</u></b>	<b><u>89.9</u></b>	124	90.3	125	89.7	<b><u>124</u></b>	<b><u>89.9</u></b>	124	90.3
482.sphinx3	243	80.2	<b><u>243</u></b>	<b><u>80.2</u></b>	244	79.8	243	80.2	<b><u>243</u></b>	<b><u>80.2</u></b>	244	79.8

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.rev6993

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Hardware Availability: Apr-2016

Software Availability: Sep-2016

### Platform Notes (Continued)

Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on linux-3y2r Mon Apr 3 21:06:16 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 E7-8893 v4 @ 3.20GHz
 4 "physical id"s (chips)
 16 "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 : 4
  siblings  : 4
  physical 0: cores 12 13 25 26
  physical 1: cores 12 13 25 26
  physical 2: cores 12 13 25 26
  physical 3: cores 12 13 25 26
cache size : 61440 KB

```

```

From /proc/meminfo
MemTotal:      1058515988 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-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 10 21:31

```

SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on

```

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## Platform Notes (Continued)

/dev/sda1 xfs 373G 22G 351G 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:

KMP\_AFFINITY = "granularity=fine,compact"

LD\_LIBRARY\_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh10.2"

OMP\_NUM\_THREADS = "16"

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

## 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

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## Base Portability Flags (Continued)

```

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

```

## Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

## 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: -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

447.dealII: basepeak = yes

450.soplex: basepeak = yes

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 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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: basepeak = yes

459.GemsFDTD: -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  
-qopt-prefetch -parallel

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) -inline-calloc -qopt-malloc-options=3  
-auto -unroll4

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## Peak Optimization Flags (Continued)

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

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-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>

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

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