



SPEC® CFP2006 Result

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Cisco Systems

Cisco UCS C220 M4 (Intel Xeon E5-2640 v4 2.40 GHz)

SPECfp®2006 = 117

SPECfp_base2006 = 111

CPU2006 license: 9019

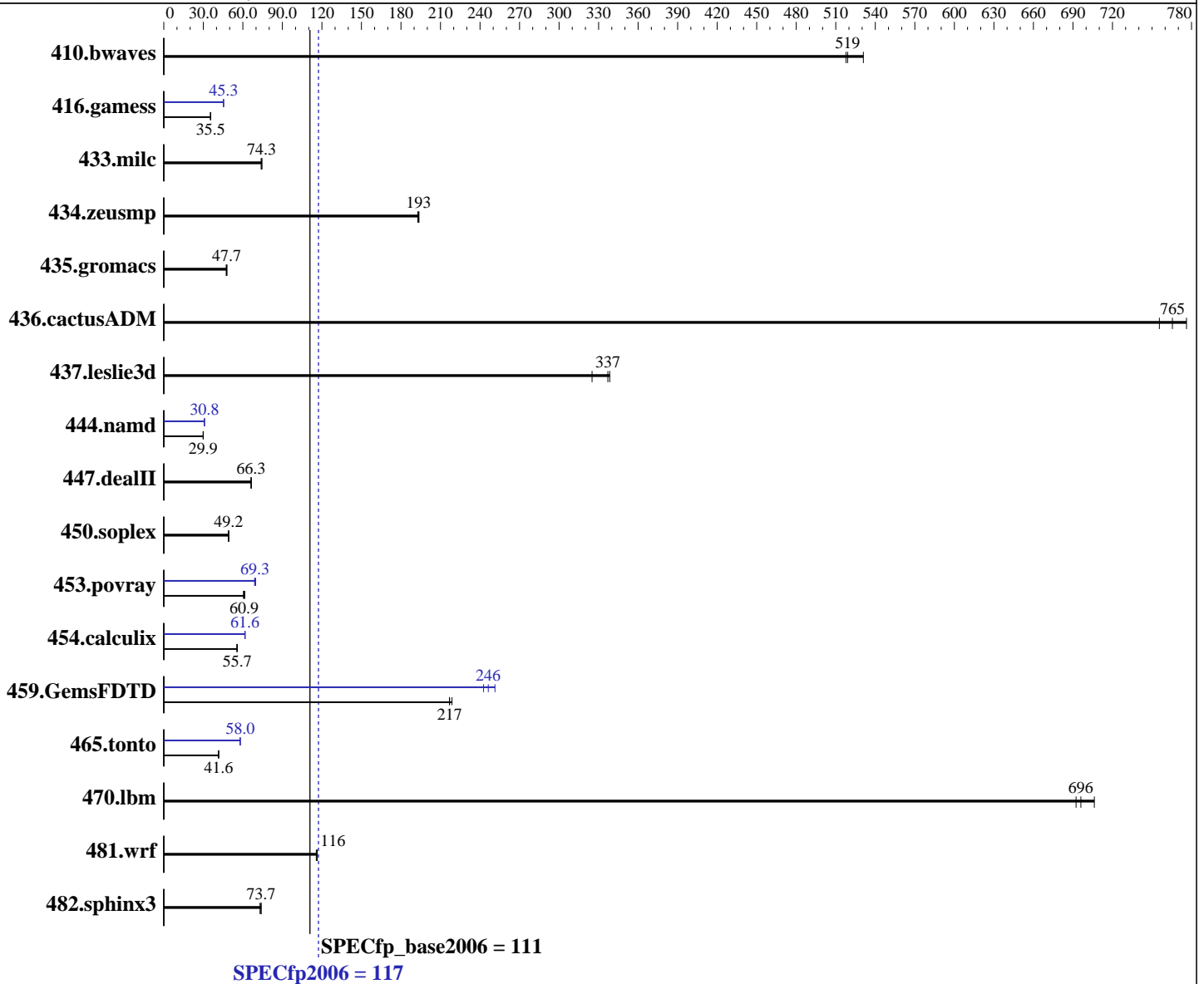
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Dec-2016

Hardware Availability: Apr-2016

Software Availability: Dec-2015



Hardware		Software	
CPU Name:	Intel Xeon E5-2640 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; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
CPU MHz:	2400	Auto Parallel:	Yes
FPU:	Integrated	File System:	xfs
CPU(s) enabled:	20 cores, 2 chips, 10 cores/chip	System State:	Run level 3 (multi-user)
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		

Continued on next page

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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 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	26.2	518	25.6	531	<u>26.2</u>	<u>519</u>	26.2	518	25.6	531	<u>26.2</u>	<u>519</u>
416.gamess	<u>551</u>	<u>35.5</u>	551	35.5	553	35.4	<u>432</u>	<u>45.3</u>	432	45.3	432	45.3
433.milc	<u>124</u>	<u>74.3</u>	123	74.5	124	73.9	<u>124</u>	<u>74.3</u>	123	74.5	124	73.9
434.zeusmp	47.0	194	47.2	193	<u>47.0</u>	<u>193</u>	47.0	194	47.2	193	<u>47.0</u>	<u>193</u>
435.gromacs	149	48.0	<u>150</u>	<u>47.7</u>	151	47.3	149	48.0	<u>150</u>	<u>47.7</u>	151	47.3
436.cactusADM	15.4	776	15.8	756	<u>15.6</u>	<u>765</u>	15.4	776	15.8	756	<u>15.6</u>	<u>765</u>
437.leslie3d	<u>27.9</u>	<u>337</u>	28.9	325	27.8	338	<u>27.9</u>	<u>337</u>	28.9	325	27.8	338
444.namd	268	29.9	<u>268</u>	<u>29.9</u>	268	29.9	260	30.8	260	30.8	<u>260</u>	<u>30.8</u>
447.dealII	172	66.4	<u>173</u>	<u>66.3</u>	173	66.2	172	66.4	<u>173</u>	<u>66.3</u>	173	66.2
450.soplex	170	49.0	169	49.3	<u>169</u>	<u>49.2</u>	170	49.0	169	49.3	<u>169</u>	<u>49.2</u>
453.povray	86.6	61.5	88.0	60.4	<u>87.3</u>	<u>60.9</u>	76.3	69.7	<u>76.8</u>	<u>69.3</u>	77.2	68.9
454.calculix	148	55.8	149	55.4	<u>148</u>	<u>55.7</u>	134	61.6	134	61.7	<u>134</u>	<u>61.6</u>
459.GemsFDTD	48.5	219	48.9	217	<u>48.9</u>	<u>217</u>	42.2	251	43.7	243	<u>43.1</u>	<u>246</u>
465.tonto	238	41.4	<u>236</u>	<u>41.6</u>	236	41.7	170	57.9	<u>170</u>	<u>58.0</u>	170	58.0
470.lbm	19.8	692	<u>19.7</u>	<u>696</u>	19.5	706	19.8	692	<u>19.7</u>	<u>696</u>	19.5	706
481.wrf	95.9	116	96.5	116	<u>96.0</u>	<u>116</u>	95.9	116	96.5	116	<u>96.0</u>	<u>116</u>
482.sphinx3	<u>264</u>	<u>73.7</u>	264	73.9	267	73.0	<u>264</u>	<u>73.7</u>	264	73.9	267	73.0

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/cpu2006-1.2/config/sysinfo.rev6914

Continued on next page



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Platform Notes (Continued)

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1
running on linux-5aj7 Mon Dec 12 11:56:32 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:      264568884 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-5aj7 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 Dec 12 07:25
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal       xfs   372G  12G  360G   4% /
Additional information from dmidecode:
```

Continued on next page



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Platform Notes (Continued)

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. C220M4.2.0.13d.0.0812161113 08/12/2016

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/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 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

433.milc: -DSPEC_CPU_LP64

434.zeusmp: -DSPEC_CPU_LP64

435.gromacs: -DSPEC_CPU_LP64 -nofor_main

Continued on next page

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Page 4



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Base Portability Flags (Continued)

```

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

Continued on next page



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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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Page 7