SPEC® CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

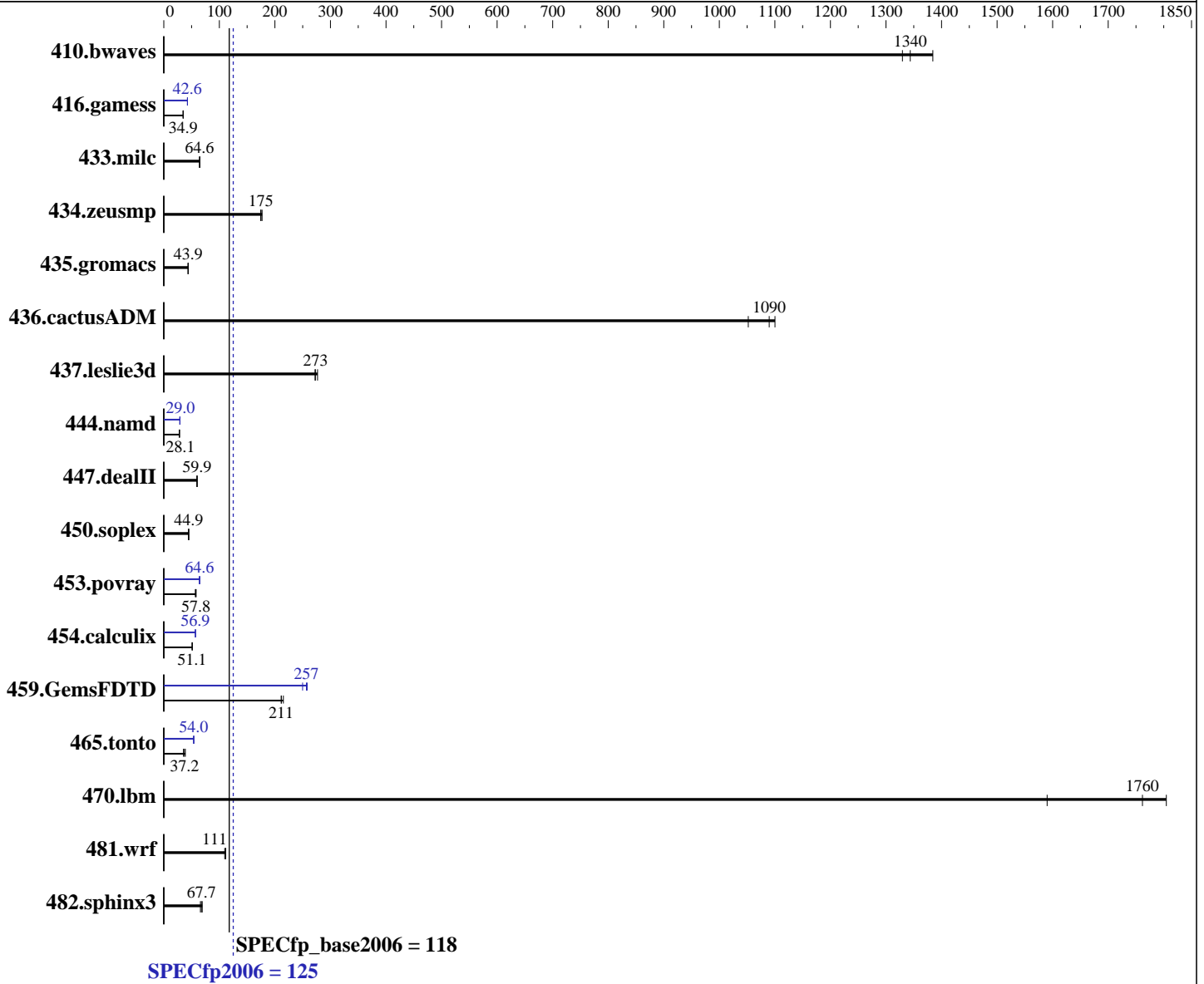$SPECfp^{®}2006 =$ 125

$SPECfp\_base2006 =$ 118

CPU2006 license:	9019	**Test date:**	Nov-2016
Test sponsor:	Cisco Systems	**Hardware Availability:**	Jul-2016
Tested by:	Cisco Systems	**Software Availability:**	Dec-2015

410.bwaves 1340
416.gamess 42.6 / 34.9
433.milc 64.6
434.zeusmp 175
435.gromacs 43.9
436.cactusADM 1090
437.leslie3d 273
444.namd 29.0 / 28.1
447.dealII 59.9
450.soplex 44.9
453.povray 64.6 / 57.8
454.calculix 56.9 / 51.1
459.GemsFDTD 257 / 211
465.tonto 54.0 / 37.2
470.lbm 1760
481.wrf 111
482.sphinx3 67.7

SPECfp_base2006 = 118

SPECfp2006 = 125

Hardware

CPU Name:	Intel Xeon E7-8860 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	72 cores, 4 chips, 18 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

Continued on next page

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:	ext4
System State:	Run level 3 (multi-user)

Continued on next page

SPEC CFP2006 Result

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

SPECfp2006 =	125
SPECfp_base2006 =	118

CPU2006 license:	9019	**Test date:**	Nov-2016
Test sponsor:	Cisco Systems	**Hardware Availability:**	Jul-2016
Tested by:	Cisco Systems	**Software Availability:**	Dec-2015

L3 Cache:	45 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)	Other Software:	None
Disk Subsystem:	1 x 400 GB SAS SSD		
Other Hardware:	None		

Results Table

Benchmark	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	9.82	1380	10.2	1330	**10.1**	**1340**	9.82	1380	10.2	1330	**10.1**	**1340**
416.gamess	564	34.7	561	34.9	**561**	**34.9**	460	42.5	**460**	**42.6**	460	42.6
433.milc	141	64.9	143	64.2	**142**	**64.6**	141	64.9	143	64.2	**142**	**64.6**
434.zeusmp	**52.0**	**175**	51.4	177	52.2	174	**52.0**	**175**	51.4	177	52.2	174
435.gromacs	**163**	**43.9**	164	43.6	163	43.9	**163**	**43.9**	164	43.6	163	43.9
436.cactusADM	10.9	1100	**11.0**	**1090**	11.4	1050	10.9	1100	**11.0**	**1090**	11.4	1050
437.leslie3d	**34.4**	**273**	34.0	277	34.5	272	**34.4**	**273**	34.0	277	34.5	272
444.namd	**285**	**28.1**	285	28.1	285	28.1	277	29.0	276	29.0	**277**	**29.0**
447.dealII	**191**	**59.9**	190	60.1	192	59.5	**191**	**59.9**	190	60.1	192	59.5
450.soplex	185	45.0	188	44.4	**186**	**44.9**	185	45.0	188	44.4	**186**	**44.9**
453.povray	91.6	58.1	93.8	56.7	**92.0**	**57.8**	**82.4**	**64.6**	83.2	63.9	82.2	64.7
454.calculix	**161**	**51.1**	161	51.2	161	51.1	145	57.0	**145**	**56.9**	145	56.9
459.GemsFDTD	49.3	215	50.2	211	**50.2**	**211**	42.5	250	41.1	258	**41.3**	**257**
465.tonto	278	35.4	254	38.8	**265**	**37.2**	182	54.1	184	53.5	**182**	**54.0**
470.lbm	**7.80**	**1760**	7.61	1800	8.64	1590	**7.80**	**1760**	7.61	1800	8.64	1590
481.wrf	100	112	102	110	**101**	**111**	100	112	102	110	**101**	**111**
482.sphinx3	282	69.2	**288**	**67.7**	296	65.9	282	69.2	**288**	**67.7**	296	65.9

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 set to Balanced Performance
Memory RAS configuration set to Maximum Performance
Memory Power Saving Mode set to Disabled
QPI Snoop Mode set to Home Snoop
 Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6914
```

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

$SPECfp2006 =$ 125

$SPECfp\_base2006 =$ 118

CPU2006 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

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

Platform Notes (Continued)

```
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-23mz Mon Nov 14 23:55:24 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 E7-8860 v4 @ 2.20GHz
      4 "physical id"s (chips)
      72 "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 : 18
      siblings  : 18
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 46080 KB

From /proc/meminfo
   MemTotal:        529297732 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-23mz 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 Nov 14 08:45
```

SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

SPECfp2006 = 125

SPECfp_base2006 = 118

Platform Notes (Continued)

```
  SPEC is set to: /opt/cpu2006-1.2
     Filesystem      Type  Size  Used Avail Use% Mounted on
     /dev/sdb1       ext4  366G   35G  331G  10% /
  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. C460M4.2.0.11.36.042520161128 04/25/2016
   Memory:
    32x 0xCE00 M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz, configured at 1600 MHz
    64x 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 = "72"

 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
    416.gamess: -DSPEC_CPU_LP64
```

Continued on next page

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

SPECfp2006 =	125
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

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
```

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

$SPECfp2006 =$ 125

$SPECfp\_base2006 =$ 118

CPU2006 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

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

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

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8860 v4 2.20 GHz)

SPECfp2006 =   125

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

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

---

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Dec 15 11:18:37 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 13 December 2016.