SPEC® CFP2006 Result
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Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8870 v4 2.10 GHz)

$SPECfp^®2006 =$ 121
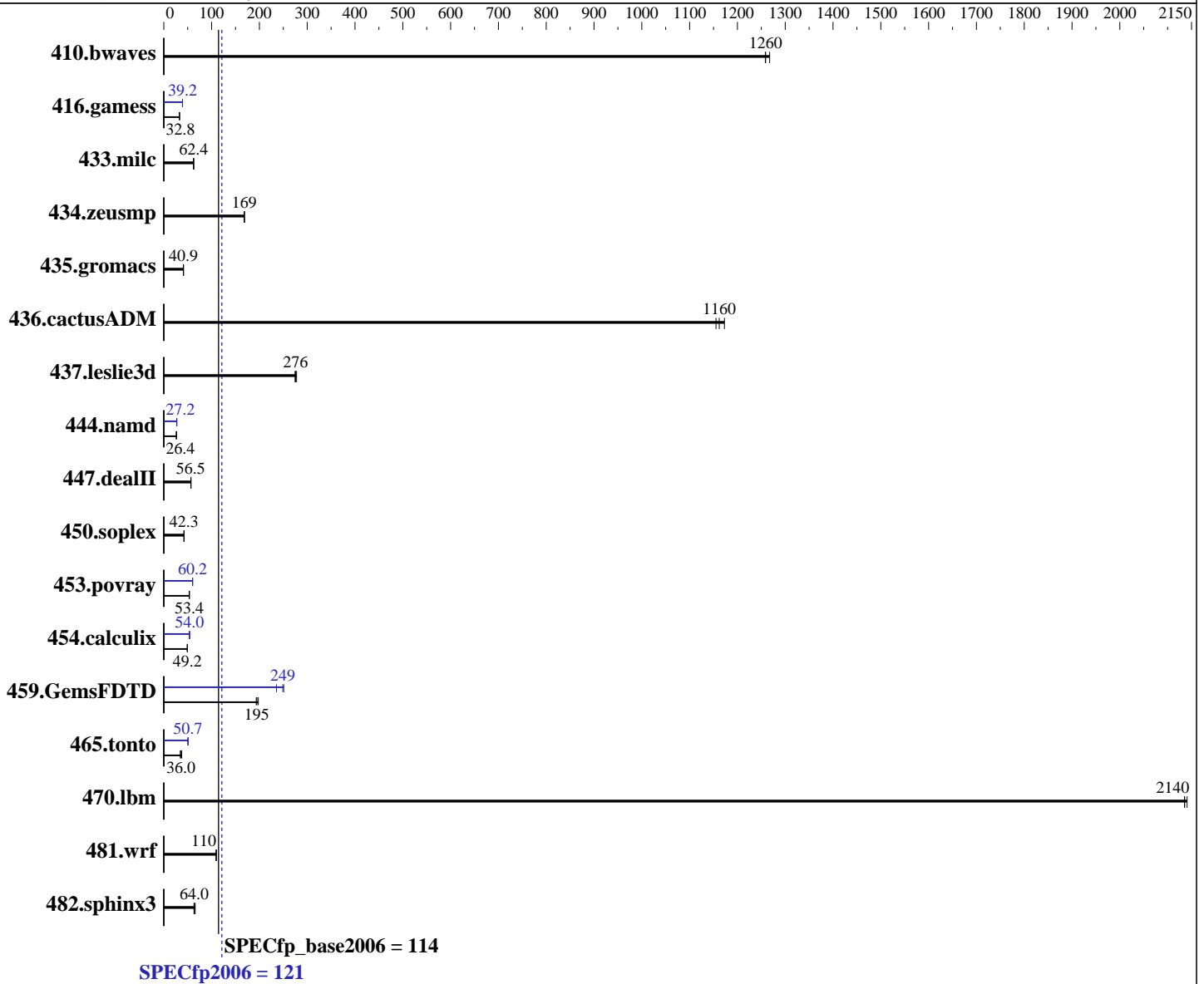
$SPECfp\_base2006 =$ 114

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

SPECfp_base2006 = 114

SPECfp2006 = 121

Hardware

CPU Name:	Intel Xeon E7-8870 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	80 cores, 4 chips, 20 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

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

Continued on next page

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L3 Cache:	50 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	10.7	1270	**10.8**	**1260**	10.8	1260	10.7	1270	**10.8**	**1260**	10.8	1260
416.gamess	**597**	**32.8**	598	32.8	596	32.9	502	39.0	**500**	**39.2**	500	39.2
433.milc	147	62.4	147	62.4	**147**	**62.4**	147	62.4	147	62.4	**147**	**62.4**
434.zeusmp	54.1	168	54.0	169	**54.0**	**169**	54.1	168	54.0	169	**54.0**	**169**
435.gromacs	175	40.8	**174**	**40.9**	173	41.4	175	40.8	**174**	**40.9**	173	41.4
436.cactusADM	10.3	1160	10.2	1170	**10.3**	**1160**	10.3	1160	10.2	1170	**10.3**	**1160**
437.leslie3d	33.8	278	**34.1**	**276**	34.2	275	33.8	278	**34.1**	**276**	34.2	275
444.namd	304	26.4	304	26.4	**304**	**26.4**	295	27.2	**295**	**27.2**	296	27.1
447.dealII	200	57.1	202	56.5	**202**	**56.5**	200	57.1	202	56.5	**202**	**56.5**
450.soplex	197	42.3	197	42.4	**197**	**42.3**	197	42.3	197	42.4	**197**	**42.3**
453.povray	99.7	53.4	**99.7**	**53.4**	99.6	53.4	88.4	60.2	**88.3**	**60.2**	88.2	60.4
454.calculix	167	49.3	**168**	**49.2**	168	49.2	155	53.2	**153**	**54.0**	152	54.2
459.GemsFDTD	**54.5**	**195**	54.9	193	53.7	198	42.3	251	**42.6**	**249**	45.0	236
465.tonto	**273**	**36.0**	262	37.5	286	34.5	194	50.7	**194**	**50.7**	195	50.5
470.lbm	**6.43**	**2140**	6.43	2140	6.42	2140	**6.43**	**2140**	6.43	2140	6.42	2140
481.wrf	**102**	**110**	102	110	102	109	**102**	**110**	102	110	102	109
482.sphinx3	**305**	**64.0**	308	63.2	297	65.6	**305**	**64.0**	308	63.2	297	65.6

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

Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/

Page 2

Cisco Systems

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$SPECfp2006 =$ 121

$SPECfp\_base2006 =$ 114

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

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

Platform Notes (Continued)

```
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-69f9 Sun Oct  2 14:30:59 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 E7-8870 v4 @ 2.10GHz
      4 "physical id"s (chips)
      80 "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 : 20
      siblings  : 20
      physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
      physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
      physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
      physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
   cache size : 51200 KB

From /proc/meminfo
   MemTotal:       529297028 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

run-level 3 Oct 1 22:37

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

Continued on next page

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Platform Notes (Continued)

```
      /dev/sda1      xfs    372G   39G  333G  11% /
 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. C460M4.2.0.12b.0.062120160920 06/21/2016
    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 = "80"

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

Test date: Oct-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
```

Continued on next page

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Tested by:	Cisco Systems	**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 Wed Oct 19 10:29:28 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 18 October 2016.