Cisco Systems
Cisco UCS C240M5 (Intel Xeon Gold 6128, 3.40GHz)

<table>
<thead>
<tr>
<th>SPECfp&lt;sup&gt;®&lt;/sup&gt;2006 = 138</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp&lt;sub&gt;base&lt;/sub&gt;2006 = 135</td>
</tr>
</tbody>
</table>

Cisco Systems

CPU2006 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems
Test date: Aug-2017
Hardware Availability: Aug-2017
Software Availability: Apr-2017

SPECfp<sup>®</sup>2006 = 138
SPECfp<sub>base</sub>2006 = 135

| 410.bwaves | 416.gamess | 433.milc | 434.zeusmp | 435.gromacs | 436.cactusADM | 437.leslie3d | 444.namd | 447.dealII | 450.soplex | 453.povray | 454.calculix | 459.GemsFDTD | 465.tonto | 470.lbm | 481.wrf | 482.sphinx3 |
|------------|------------|---------|------------|------------|--------------|-------------|---------|-----------|-----------|----------|------------|------------|------------|---------|---------|---------|---------|
| 51.7       | 49.2       | 77.6    | 249        | 69.1       |              | 398         | 36.5    | 35.6      | 71.9      | 49.3     | 78.9       | 69.6       | 76.7       | 76.8    | 282      | 248      | 66.3    |
| 766        |            |         |            |            |              | 1000        |         |           |           |          |            |            |            |         |         |         |

Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
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<tr>
<td>File System:</td>
<td>xfs</td>
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<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
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</table>

Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 6128</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>3400</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>12 cores, 2 chips, 6 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
</tr>
</tbody>
</table>

Continued on next page
Cisco Systems

Cisco UCS C240M5 (Intel Xeon Gold 6128, 3.40GHz)

SPECfp2006 = 138
SPECfp_base2006 = 135

CPU2006 license: 9019
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Tested by: Cisco Systems

L3 Cache: 19.25 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 1 x 800 GB SAS HDD, 10K RPM
Other Hardware: None
Base Pointers: 64-bit
Peak Pointers: 32/64-bit

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
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<td>84.9</td>
<td>231</td>
<td>84.4</td>
<td>229</td>
<td>85.0</td>
</tr>
</tbody>
</table>

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 HyperThreading Technology set to Disabled
CPU performance set to Enterprise
Power Performance Tuning set to OS
SNC set to Disabled
IMC Interleaving set to Auto
Patrol Scrub set to Disabled
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-0s5q Wed Aug 30 16:12:31 2017
Continued on next page
Cisco Systems

Cisco UCS C240M5 (Intel Xeon Gold 6128, 3.40GHz)

SPECfp2006 = 138
SPECfp_base2006 = 135

Platform Notes (Continued)

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) Gold 6128 CPU @ 3.40GHz
2 "physical id"s (chips)
12 "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 : 6
siblings : 6
physical 0: cores 0 6 9 10 11 13
physical 1: cores 0 6 9 10 11 13

From /proc/meminfo

MemTotal: 394864940 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# 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-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
Linux linux-0s5q 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 30 03:14

SPEC is set to: /opt/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 xfs 700G 83G 618G 12% /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
Cisco Systems
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Platform Notes (Continued)
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. C240M5.3.1.1d.0.0615170707 06/15/2017
Memory:
24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 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/lib/i386:/opt/cpu2006-1.2/lib/intel64:/opt/cpu2006-1.2/sh10.2"
OMP_NUM_THREADS = "12"

Binaries compiled on a system with 1x Intel Core i7-4790 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
  434.zeusmp: -DSPEC_CPU_LP64 -nofor_main
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
  436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
  437.leslie3d: -DSPEC_CPU_LP64
  444.namd: -DSPEC_CPU_LP64

Continued on next page
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### Base Portability Flags (Continued)

- 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.ffa: -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

### Peak Portability Flags

Same as Base Portability Flags
Cisco Systems
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Tested by: Cisco Systems

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Hardware Availability: Aug-2017
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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-llp32
   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

Benchmarks using both Fortran and C:
   435.gromacs: basepeak = yes
   436.cactusADM: basepeak = yes

Continued on next page
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Peak Optimization Flags (Continued)

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-revF.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revH.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-revF.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revH.xml

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

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