Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

<table>
<thead>
<tr>
<th>SPECfp®2006 = 126</th>
<th>SPECfp_base2006 = 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license: 9019</td>
<td>Test date: Aug-2017</td>
</tr>
<tr>
<td>Test sponsor: Cisco Systems</td>
<td>Hardware Availability: Aug-2017</td>
</tr>
<tr>
<td>Tested by: Cisco Systems</td>
<td>Software Availability: Apr-2017</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPEC Test</th>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>51.4</td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>48.8</td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>76.3</td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>219</td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>68.6</td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>790</td>
<td>790</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>444.namd</td>
<td>36.5</td>
<td>35.6</td>
</tr>
<tr>
<td>447.dealII</td>
<td>71.8</td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>48.1</td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>79.0</td>
<td>69.5 76.6</td>
</tr>
<tr>
<td>454.calculix</td>
<td>76.7</td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>211</td>
<td>195</td>
</tr>
<tr>
<td>465.tonto</td>
<td>66.1</td>
<td>60.5</td>
</tr>
<tr>
<td>470.lbm</td>
<td>98.8</td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td>84.2</td>
<td></td>
</tr>
</tbody>
</table>

Hardware
CPU Name: Intel Xeon Platinum 8156
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3600
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1.2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core

Software
Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64)
Compiler: 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
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

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>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>22.7</td>
<td>599</td>
<td>22.5</td>
<td>603</td>
<td>22.3</td>
<td>610</td>
<td>22.7</td>
<td>599</td>
<td>22.5</td>
<td>603</td>
<td>22.3</td>
<td>610</td>
</tr>
<tr>
<td>416.gamess</td>
<td>401</td>
<td>48.9</td>
<td>401</td>
<td>48.8</td>
<td>401</td>
<td>48.8</td>
<td>381</td>
<td>51.4</td>
<td>382</td>
<td>51.3</td>
<td>380</td>
<td>51.5</td>
</tr>
<tr>
<td>433.milc</td>
<td>120</td>
<td>76.3</td>
<td>120</td>
<td>76.3</td>
<td>120</td>
<td>76.4</td>
<td>120</td>
<td>76.3</td>
<td>120</td>
<td>76.3</td>
<td>120</td>
<td>76.4</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>41.6</td>
<td>219</td>
<td>41.3</td>
<td>220</td>
<td>41.5</td>
<td>219</td>
<td>41.6</td>
<td>219</td>
<td>41.3</td>
<td>220</td>
<td>41.5</td>
<td>219</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>104</td>
<td>68.7</td>
<td>104</td>
<td>68.6</td>
<td>104</td>
<td>68.6</td>
<td>104</td>
<td>68.7</td>
<td>104</td>
<td>68.7</td>
<td>104</td>
<td>68.6</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>15.0</td>
<td>797</td>
<td>15.4</td>
<td>775</td>
<td>15.1</td>
<td>790</td>
<td>15.0</td>
<td>797</td>
<td>15.4</td>
<td>775</td>
<td>15.1</td>
<td>790</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>29.0</td>
<td>324</td>
<td>29.3</td>
<td>320</td>
<td>29.7</td>
<td>316</td>
<td>29.0</td>
<td>324</td>
<td>29.3</td>
<td>320</td>
<td>29.7</td>
<td>316</td>
</tr>
<tr>
<td>444.namd</td>
<td>225</td>
<td>35.6</td>
<td>225</td>
<td>35.6</td>
<td>225</td>
<td>35.6</td>
<td>220</td>
<td>36.5</td>
<td>220</td>
<td>36.5</td>
<td>220</td>
<td>36.5</td>
</tr>
<tr>
<td>447.dealII</td>
<td>159</td>
<td>71.8</td>
<td>159</td>
<td>71.8</td>
<td>160</td>
<td>71.6</td>
<td>159</td>
<td>71.8</td>
<td>159</td>
<td>71.8</td>
<td>160</td>
<td>71.6</td>
</tr>
<tr>
<td>450.soplex</td>
<td>173</td>
<td>48.1</td>
<td>173</td>
<td>48.2</td>
<td>175</td>
<td>47.6</td>
<td>173</td>
<td>48.1</td>
<td>173</td>
<td>48.2</td>
<td>175</td>
<td>47.6</td>
</tr>
<tr>
<td>453.povray</td>
<td>76.7</td>
<td>69.4</td>
<td>76.5</td>
<td>69.5</td>
<td>76.4</td>
<td>69.6</td>
<td>67.4</td>
<td>79.0</td>
<td>67.6</td>
<td>78.7</td>
<td>67.4</td>
<td>79.0</td>
</tr>
<tr>
<td>454.calculix</td>
<td>107</td>
<td>76.8</td>
<td>108</td>
<td>76.6</td>
<td>108</td>
<td>76.7</td>
<td>107</td>
<td>76.8</td>
<td>108</td>
<td>76.6</td>
<td>108</td>
<td>76.4</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>54.4</td>
<td>195</td>
<td>54.7</td>
<td>194</td>
<td>54.2</td>
<td>196</td>
<td>50.3</td>
<td>211</td>
<td>50.4</td>
<td>211</td>
<td>50.3</td>
<td>211</td>
</tr>
<tr>
<td>465.tonto</td>
<td>163</td>
<td>60.3</td>
<td>163</td>
<td>60.5</td>
<td>163</td>
<td>60.5</td>
<td>148</td>
<td>66.3</td>
<td>149</td>
<td>66.1</td>
<td>149</td>
<td>66.1</td>
</tr>
<tr>
<td>470.lbm</td>
<td>22.4</td>
<td>614</td>
<td>22.4</td>
<td>614</td>
<td>22.4</td>
<td>614</td>
<td>22.4</td>
<td>614</td>
<td>22.4</td>
<td>614</td>
<td>22.4</td>
<td>614</td>
</tr>
<tr>
<td>481.wrf</td>
<td>113</td>
<td>98.8</td>
<td>114</td>
<td>97.8</td>
<td>113</td>
<td>99.2</td>
<td>113</td>
<td>98.8</td>
<td>114</td>
<td>97.8</td>
<td>113</td>
<td>99.2</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>232</td>
<td>84.2</td>
<td>232</td>
<td>84.3</td>
<td>231</td>
<td>84.3</td>
<td>232</td>
<td>84.2</td>
<td>232</td>
<td>84.2</td>
<td>231</td>
<td>84.3</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 /home/cpu2006-1.2/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e84d4b51ed28d7f98696cbe290c1)
runtime on linux-3joc Thu Aug 31 14:01:50 2017
Continued on next page
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

SPECfp2006 = 126
SPECfp_base2006 = 123

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

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) Platinum 8156 CPU @ 3.60GHz
2 "physical id"s (chips)
8 "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 0 5 9 13
physical 1: cores 1 5 9 13
cache size : 16896 KB

From /proc/meminfo
MemTotal:       394864856 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

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-3joc 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 31 14:01

SPEC is set to: /home/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 516G 27G 489G 6% /home
Continued on next page
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

SPECfp2006 = 126
SPECfp_base2006 = 123

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

Platform Notes (Continued)

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. C220M5.3.1.1d.0.0615170645 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 = "/home/cpu2006-1.2/lib/ia32:/home/cpu2006-1.2/lib/intel64:/home/cpu2006-1.2/sh10.2"
OMP_NUM_THREADS = "8"

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
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

SPECfp2006 = 126
SPECfp_base2006 = 123

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

Test date: Aug-2017
Hardware Availability: Aug-2017
Software Availability: Apr-2017

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
463.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
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

SPECfp2006 = 126
SPECfp_base2006 = 123

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

Test date: Aug-2017
Hardware Availability: Aug-2017
Software Availability: Apr-2017

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-ii-p32

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

Continued on next page
### Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8156, 3.60GHz)

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>126</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>123</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>9019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Cisco Systems</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Cisco Systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test date:</th>
<th>Aug-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Aug-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Apr-2017</td>
</tr>
</tbody>
</table>

### 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:


You can also download the XML flags sources by saving the following links:


---

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 19 September 2017.