Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

SPECfp\textsuperscript{®}2006 = 117
SPECfp\_base2006 = 113

<table>
<thead>
<tr>
<th>Test sponsor: Cisco Systems</th>
<th>CPU2006 license: 9019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by: Cisco Systems</td>
<td>Test date: Dec-2017</td>
</tr>
<tr>
<td>Software Availability: Apr-2017</td>
<td>Hardware Availability: Aug-2017</td>
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<table>
<thead>
<tr>
<th>SPECfp2006 = 117</th>
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<tr>
<td>SPECfp_base2006 = 113</td>
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</tbody>
</table>

Cisco UCS C220 M5

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Silver 4114</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.00 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2200</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>20 cores, 2 chips, 10 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB L1 + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB 14-D on chip per core</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECfp\textsuperscript{®}2006 = 117</th>
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</thead>
<tbody>
<tr>
<td>SPECfp_base2006 = 113</td>
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</tbody>
</table>

<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>
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<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
</tr>
<tr>
<td>416.game6</td>
</tr>
<tr>
<td>433.milc</td>
</tr>
<tr>
<td>434.zeusmp</td>
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<tr>
<td>435.gromacs</td>
</tr>
<tr>
<td>436.cactusADM</td>
</tr>
<tr>
<td>437.leslie3d</td>
</tr>
<tr>
<td>444.namd</td>
</tr>
<tr>
<td>447.dealII</td>
</tr>
<tr>
<td>450.soplex</td>
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<tr>
<td>453.povray</td>
</tr>
<tr>
<td>454.calculix</td>
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<tr>
<td>459.GemsFDTD</td>
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<tr>
<td>465.tonto</td>
</tr>
<tr>
<td>470.lbm</td>
</tr>
<tr>
<td>481.wrf</td>
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<tr>
<td>482.sphinx3</td>
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</table>

<table>
<thead>
<tr>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
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<tr>
<td>Compiler:</td>
</tr>
<tr>
<td>Auto Parallel:</td>
</tr>
<tr>
<td>File System:</td>
</tr>
<tr>
<td>System State:</td>
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</tbody>
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Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base Pointers</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak Pointers</th>
<th>Seconds</th>
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<tbody>
<tr>
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<td>508</td>
<td>38.5</td>
<td><strong>509</strong></td>
<td><strong>38.5</strong></td>
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<td><strong>43.9</strong></td>
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<td>955</td>
<td><strong>12.5</strong></td>
<td><strong>954</strong></td>
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<td><strong>59.4</strong></td>
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<td>450.soplex</td>
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<td>40.2</td>
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<td>40.6</td>
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<td>453.povray</td>
<td>94.2</td>
<td>56.5</td>
<td>94.4</td>
<td>56.3</td>
<td><strong>94.3</strong></td>
<td><strong>56.4</strong></td>
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<td>454.calculix</td>
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<td>59.4</td>
<td><strong>139</strong></td>
<td><strong>59.4</strong></td>
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<td><strong>133</strong></td>
<td><strong>62.2</strong></td>
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<tr>
<td>459.GemsFDTD</td>
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<td>47.9</td>
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<td><strong>46.7</strong></td>
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<td>481.wrf</td>
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<td>482.sphinx3</td>
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<td>345</td>
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<td><strong>344</strong></td>
<td><strong>56.6</strong></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 (b5e8d4b4eb51ed28d7f98696cbe290c1)
Continued on next page
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

SPECfp2006 = 117
SPECfp_base2006 = 113

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

Platform Notes (Continued)

running on linux-79ix Fri Dec 8 06:07:58 2017

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) Silver 4114 CPU @ 2.20GHz
  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 : 14080 KB

From /proc/meminfo
MemTotal:       394653912 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:
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 8 06:05

SPEC is set to: /home/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb7 xfs 416G 118G 299G 29% /home

Additional information from dmidecode:

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Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

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CPU2006 license: 9019
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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. C220M5.3.1.1d.0.0615170645 06/15/2017
Memory:
24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz, configured at 2400 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 = "20"

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
  436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
  437.leslie3d: -DSPEC_CPU_LP64

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Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

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<tr>
<td>SPECfp_base2006</td>
<td>113</td>
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</table>

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

**Base Portability Flags (Continued)**

- 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 -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
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

SPECfp2006 = 117
SPECfp_base2006 = 113

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

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

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

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Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4114, 2.20 GHz)

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

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

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 other inquiries, please contact webmaster@spec.org.

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