Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Silver 4110, 2.10 GHz)

SPECfp\textsuperscript{2006} = 114
SPECfp_base2006 = 109

<table>
<thead>
<tr>
<th>Test sponsor: Cisco Systems</th>
<th>Test date: Dec-2017</th>
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<tbody>
<tr>
<td>Tested by: Cisco Systems</td>
<td>Hardware Availability: Aug-2017</td>
</tr>
<tr>
<td>CPU2006 license: 9019</td>
<td>Software Availability: Apr-2017</td>
</tr>
<tr>
<td>CPU Name: Intel Xeon Silver 4110</td>
<td></td>
</tr>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz</td>
<td></td>
</tr>
<tr>
<td>CPU MHz: 2100</td>
<td></td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td></td>
</tr>
<tr>
<td>CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip</td>
<td></td>
</tr>
<tr>
<td>CPU(s) orderable: 1,2 chips</td>
<td></td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td></td>
</tr>
<tr>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 12 SP2(x86_64) 4.4.21-69-default</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
</tr>
<tr>
<td>File System: xfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>
Cisco Systems

Cisco UCS B200 M5 (Intel Xeon Silver 4110, 2.10 GHz)

**SPEC CFP2006 Result**

**Test date:** Dec-2017

**Hardware Availability:** Aug-2017

**Software Availability:** Apr-2017

**CPU2006 license:** 9019

**Test sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**L3 Cache:** 11 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R, running at 2400)

**Disk Subsystem:** 1 x 600 GB SAS HDD, 10K RPM

**Other Hardware:** None

**Base Pointers:** 64-bit

**Peak Pointers:** 32/64-bit

**Other Software:** None

**SPECfp2006 =** 114

**SPECfp_base2006 =** 109

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
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<tbody>
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<td>410.bwaves</td>
<td>20.3</td>
<td>668</td>
<td>20.3</td>
<td>671</td>
<td>20.1</td>
<td>675</td>
<td>20.3</td>
<td>668</td>
<td>20.3</td>
<td>671</td>
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<tr>
<td>416.gamess</td>
<td>508</td>
<td>38.5</td>
<td>509</td>
<td>38.5</td>
<td>509</td>
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<td>70.6</td>
<td>130</td>
<td>70.4</td>
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<td>70.6</td>
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<td>434.zeusmp</td>
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<td>435.gromacs</td>
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<td>42.7</td>
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<td>437.leslie3d</td>
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<td>459.GemsFDTD</td>
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<td>465.tonto</td>
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<td>40.7</td>
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<td>40.6</td>
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<td>55.3</td>
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<td>481.wrf</td>
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<td>482.sphinx3</td>
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<td>57.2</td>
<td>343</td>
<td>56.8</td>
<td>340</td>
<td>57.3</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 (b5e8d4b4eb51ed28d7f98696cbe290c1)
Continued on next page
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Silver 4110, 2.10 GHz)

SPECfp2006 = 114
SPECfp_base2006 = 109

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

Platform Notes (Continued)
running on linux-qc7k Fri Dec 1 17:19:48 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 4110 CPU @ 2.10GHz
  2 "physical id"s (chips)
  16 "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 : 8
    siblings : 8
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7
  cache size : 11264 KB

From /proc/meminfo
  MemTotal:       395606600 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-qc7k 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 Jan 8 05:16

SPEC is set to: /home/cpu2006-1.2
  Filesystem     Type Size Used Avail Use% Mounted on
  /dev/sdal     xfs  224G  75G  149G 34% /

Additional information from dmidecode:

Continued on next page
Cisco Systems
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Test date: Dec-2017
Hardware Availability: Aug-2017
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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. B200M5.3.2.1d.5.0727171353 07/27/2017
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 = "16"
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 B200 M5 (Intel Xeon Silver 4110, 2.10 GHz)

### SPEC CFP2006 Result

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<tr>
<th>CPU2006 license:</th>
<th>9019</th>
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### SPECfp2006 = 114

### SPECfp_base2006 = 109

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</tr>
</tbody>
</table>

### 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 B200 M5 (Intel Xeon Silver 4110, 2.10 GHz)

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CPU2006 license: 9019
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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-ilp32

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
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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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