Cisco Systems
Cisco UCS C240 M5 (Intel Xeon Platinum 8160, 2.10GHz)

<table>
<thead>
<tr>
<th>Spec Test</th>
<th>SPECint_rate2006</th>
<th>SPECint_rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license: 9019</td>
<td>2320</td>
<td>2210</td>
</tr>
<tr>
<td>Test date: Aug-2017</td>
<td>Hardware Availability: Aug-2017</td>
<td></td>
</tr>
<tr>
<td>Test sponsor: Cisco Systems</td>
<td>Software Availability: Apr-2017</td>
<td></td>
</tr>
<tr>
<td>Tested by: Cisco Systems</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Spec Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Platinum 8160</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz: 2100</td>
<td></td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled: 48 cores, 2 chips, 24 cores/chip, 2 threads/core</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>
<tr>
<td>L3 Cache: 33 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other Cache: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)</td>
<td></td>
</tr>
<tr>
<td>Disk Subsystem: 1 x 800 GB SSD SAS</td>
<td></td>
</tr>
<tr>
<td>Other Hardware: None</td>
<td></td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Spec Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
</tr>
<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>
<tr>
<td>Base Pointers:</td>
<td>32-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>Microquill SmartHeap V10.2</td>
</tr>
</tbody>
</table>
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SPECint_rate2006 = 2320
SPECint_rate_base2006 = 2210

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>96</td>
<td>552</td>
<td>1700</td>
<td>552</td>
<td>1700</td>
<td>553</td>
<td>1700</td>
<td>96</td>
<td>447</td>
<td>2100</td>
<td>449</td>
<td>2090</td>
<td>447</td>
<td>2100</td>
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<td>401.bzip2</td>
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<td>930</td>
<td>996</td>
<td>916</td>
<td>1010</td>
<td>918</td>
<td>1010</td>
<td>96</td>
<td>875</td>
<td>1060</td>
<td>872</td>
<td>1060</td>
<td>874</td>
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<td>403.gcc</td>
<td>96</td>
<td>484</td>
<td>1600</td>
<td>484</td>
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<td>482</td>
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<td>479</td>
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<td>429.mcf</td>
<td>96</td>
<td>295</td>
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<td>2970</td>
<td>293</td>
<td>2980</td>
<td>96</td>
<td>295</td>
<td>2970</td>
<td>294</td>
<td>2970</td>
<td>293</td>
<td>2980</td>
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<td>445.gobmk</td>
<td>96</td>
<td>749</td>
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<td>748</td>
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<td>749</td>
<td>1340</td>
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<td>456.hmmer</td>
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<td>748</td>
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<tr>
<td>462.libquantum</td>
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<td>54.6</td>
<td>36400</td>
<td>54.6</td>
<td>36400</td>
<td>54.7</td>
<td>36300</td>
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<td>54.7</td>
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<td>464.h264ref</td>
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<td>882</td>
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<td>882</td>
<td>2410</td>
<td>96</td>
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<td>2490</td>
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<tr>
<td>471.omnetpp</td>
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<td>1110</td>
<td>540</td>
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<td>519</td>
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<td>520</td>
<td>1150</td>
<td>520</td>
<td>1150</td>
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<tr>
<td>473.astar</td>
<td>96</td>
<td>562</td>
<td>1200</td>
<td>562</td>
<td>1200</td>
<td>562</td>
<td>1200</td>
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<td>1200</td>
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<td>1200</td>
<td>560</td>
<td>1200</td>
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<tr>
<td>483.xalancbmk</td>
<td>96</td>
<td>274</td>
<td>2420</td>
<td>273</td>
<td>2430</td>
<td>274</td>
<td>2420</td>
<td>96</td>
<td>274</td>
<td>2420</td>
<td>273</td>
<td>2430</td>
<td>274</td>
<td>2420</td>
</tr>
</tbody>
</table>

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS Settings:
Intel HyperThreading Technology set to Enabled
CPU performance set to Enterprise
Power Performance Tuning set to OS
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runtime on linux-0s5q Thu Aug 17 08:48:56 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) Platinum 8160 CPU @ 2.10GHz
Continued on next page
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SPECint_rate_base2006 = 2210

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

Platform Notes (Continued)

2 "physical id"s (chips)
96 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
cache size : 33792 KB

From /proc/meminfo
MemTotal: 394864068 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 17 08:41

SPEC is set to: /opt/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 xfs 700G 60G 640G 9% /

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. C240M5.3.1.1d.0.0615170707 06/15/2017
Continued on next page
## Cisco Systems
Cisco UCS C240 M5 (Intel Xeon Platinum 8160, 2.10GHz)  

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<th>9019</th>
<th>Test date</th>
<th>Aug-2017</th>
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<td>Test sponsor</td>
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<td>Hardware Availability</td>
<td>Aug-2017</td>
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<td>Tested by</td>
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<td>Software Availability</td>
<td>Apr-2017</td>
</tr>
</tbody>
</table>

### SPECint_rate2006 = 2320  
### SPECint_rate_base2006 = 2210

#### Platform Notes (Continued)

- 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:

- `LD_LIBRARY_PATH = "/opt/cpu2006-1.2/lib/ia32:/opt/cpu2006-1.2/lib/intel64:/opt/cpu2006-1.2/sh10.2"`

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`
- Filesystem page cache cleared with:
  - `shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run`
- Runspec command invoked through numactl i.e.:
  - `numactl --interleave=all runspec <etc>`

#### Base Compiler Invocation

- **C benchmarks**:  
  - `icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`
- **C++ benchmarks**:  
  - `icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

#### Base Portability Flags

- 400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32`
- 401.bzip2: `-D_FILE_OFFSET_BITS=64`
- 403.gcc: `-D_FILE_OFFSET_BITS=64`
- 429.mcf: `-D_FILE_OFFSET_BITS=64`
- 445.gobmk: `-D_FILE_OFFSET_BITS=64`
- 456.hmmer: `-D_FILE_OFFSET_BITS=64`
- 458.sjeng: `-D_FILE_OFFSET_BITS=64`
- 462.libquantum: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
- 464.h264ref: `-D_FILE_OFFSET_BITS=64`
- 471.omnetpp: `-D_FILE_OFFSET_BITS=64`
- 473.astar: `-D_FILE_OFFSET_BITS=64`
- 483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
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Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_andLibraries_2017/linux/lib/ia32
400.perlbench: icc -m64
401.bzip2: icc -m64
456.hmmer: icc -m64
458.sjeng: icc -m64

C++ benchmarks:
icpc -m32 -L/opt/intel/compilers_andLibraries_2017/linux/lib/ia32

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
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Peak Portability Flags (Continued)

483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

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Peak Optimization Flags (Continued)

473.astar: basepeak = yes
483.xalancbmk: basepeak = yes

Peak Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

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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