Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

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

SPECint®2006 = 75.7
SPECint_base2006 = 72.1

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

Hardware
CPU Name: Intel Xeon Gold 6128
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3400
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 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
L3 Cache: 19.25 MB I+D on chip per core
Other Cache: None
Memory: 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 1 x 600 GB SAS HDD, 10K RPM
Other Hardware: None

Software
Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo) 3.10.0-514.el7.x86_64
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2
SPEC CINT2006 Result

Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

SPECint2006 = 75.7
SPECint_base2006 = 72.1

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

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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400.perlbench</td>
<td>211</td>
<td>46.3</td>
<td>185</td>
<td>52.8</td>
<td>186</td>
<td>52.7</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>344</td>
<td>28.1</td>
<td>340</td>
<td>28.4</td>
<td>341</td>
<td>28.3</td>
</tr>
<tr>
<td>403.mcf</td>
<td>189</td>
<td>42.6</td>
<td>186</td>
<td>43.2</td>
<td>187</td>
<td>43.2</td>
</tr>
<tr>
<td>429.gcc</td>
<td>116</td>
<td>78.8</td>
<td>116</td>
<td>78.6</td>
<td>117</td>
<td>78.1</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>315</td>
<td>33.4</td>
<td>311</td>
<td>33.7</td>
<td>311</td>
<td>33.7</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>96.5</td>
<td>96.7</td>
<td>96.5</td>
<td>96.7</td>
<td>96.6</td>
<td>96.6</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>327</td>
<td>37.0</td>
<td>321</td>
<td>37.7</td>
<td>321</td>
<td>37.7</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>3.98</td>
<td>5200</td>
<td>3.98</td>
<td>5200</td>
<td>3.87</td>
<td>5360</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>309</td>
<td>71.6</td>
<td>306</td>
<td>72.2</td>
<td>306</td>
<td>72.2</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>189</td>
<td>33.1</td>
<td>189</td>
<td>33.1</td>
<td>141</td>
<td>44.3</td>
</tr>
<tr>
<td>473.astar</td>
<td>183</td>
<td>38.4</td>
<td>183</td>
<td>38.4</td>
<td>184</td>
<td>38.4</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>88.6</td>
<td>77.9</td>
<td>88.5</td>
<td>77.9</td>
<td>78.7</td>
<td>87.6</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The config file option 'submit' was used.

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 Controls
SNC set to Disabled
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on RHEL.116 Fri Dec 22 07:29:40 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) Gold 6128 CPU @ 3.40GHz
2 "physical id"s (chips)
12 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The Continued on next page
Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

**SPECint2006** = 75.7
**SPECint_base2006** = 72.1

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

### Platform Notes (Continued)

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`
- `cache size : 19712 KB`

From /proc/meminfo

- `MemTotal: 394679120 kB`
- `HugePages_Total: 0`
- `Hugepagesize: 2048 kB`

From /etc/*release* /etc/*version*

- `NAME="Red Hat Enterprise Linux Server"`
- `VERSION="7.3 (Maipo)"
- `ID="rhel"
- `ID_LIKE="fedora"
- `VERSION_ID="7.3"
- `PRETTY_NAME=OpenStack`
- `ANSI_COLOR=0;31`
- `CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
- `redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)`
- `system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)`

```
uname -a:
Linux RHEL.116 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Dec 22 07:25
```

SPEC is set to: /home/cpu2006-1.2

```
Filesystem Type   Size  Used Avail Use% Mounted on
/dev/sda5    xfs       503G  42G   461G   9% /home
```

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 06/15/2017Cisco Systems, Inc. C220M5.3.1.1d.0.0615170645 06/15/2017
Memory:
48x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz
```

(End of data from sysinfo program)

The correct amount of Memory installed is 384 GB (24 x 16 GB)
and the dmidecode is reporting invalid number of DIMMs installed

**Installed Memory:**

Continued on next page
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

SPECint2006 = 75.7  
SPECint_base2006 = 72.1

Platform Notes (Continued)
24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz

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 = "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
No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Base Compiler Invocation
C benchmarks:
  icc -m64
C++ benchmarks:
  icpc -m64

Base Portability Flags
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64

Continued on next page
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

SPECint2006 = 75.7
SPECint_base2006 = 72.1

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

CPU2006 license: 9019
Test date: Dec-2017
Hardware Availability: Aug-2017
Software Availability: Jun-2017

Base Portability Flags (Continued)

403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch
-auto-p32

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh10.2 -lsmartheap64

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64
400.perlbench: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
445.gobmk: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
473.astar: icpc -m64
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

SPECint2006 = 75.7
SPECint_base2006 = 72.1

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

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -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) -qopt-prefetch

401.bzip2: -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 -auto-ilp32 -qopt-prefetch

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
-qopt-malloc-options=3 -auto-ilp32

429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
-qopt-prefetch -auto-p32

445.gobmk: -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)

456.hmmer: basepeak = yes

458.sjeng: -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

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

Continued on next page
Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Gold 6128, 3.40 GHz)

SPECint2006 = 75.7
SPECint_base2006 = 72.1

<table>
<thead>
<tr>
<th>CPU2006 license: 9019</th>
<th>Test date: Dec-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor: Cisco Systems</td>
<td>Hardware Availability: Aug-2017</td>
</tr>
<tr>
<td>Tested by: Cisco Systems</td>
<td>Software Availability: Jun-2017</td>
</tr>
</tbody>
</table>

### Peak Optimization Flags (Continued)

- `471.omnetpp`: `-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) -qopt-ra-region-strategy=block -Wl,-z,muldefs -L/sh10.2 -lsmartheap`
- `473.astar`: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64`
- `483.xalancbmk`: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -Wl,-z,muldefs -L/sh10.2 -lsmartheap`

### Peak Other Flags

C benchmarks:

- `403.gcc`: `-Dalloca=_alloca`

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 SPECint 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 23 February 2018.