Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4112, 2.60 GHz)

SPEClint®2006 = 59.0
SPEClint_base2006 = 56.5

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

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

64-bit license

400.perlbench
401.bzip2
403.gcc
429.mcf
445.gobmk
456.hmmer
458.sjeng
462.libquantum
464.h264ref
471.omnetpp
473.astar
483.xalancbmk

SPECint2006 = 59.0
SPECint_base2006 = 56.5

Hardware
CPU Name: Intel Xeon Silver 4112
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2600
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
L3 Cache: 8.25 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

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
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds Base</th>
<th>Seconds Ratio</th>
<th>Seconds</th>
<th>Seconds Ratio</th>
<th>Seconds</th>
<th>Seconds Ratio</th>
<th>Seconds</th>
<th>Seconds Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
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<td>37.6</td>
<td>260</td>
<td>37.5</td>
<td>260</td>
<td>37.6</td>
<td>227</td>
<td>43.0</td>
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<td>401.bzip2</td>
<td>414</td>
<td>23.3</td>
<td>414</td>
<td>23.3</td>
<td>413</td>
<td>23.4</td>
<td>410</td>
<td>23.5</td>
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<tr>
<td>403.gcc</td>
<td>235</td>
<td>34.2</td>
<td>235</td>
<td>34.3</td>
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<td>34.4</td>
<td>231</td>
<td>34.9</td>
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<tr>
<td>429.mcf</td>
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<td>66.3</td>
<td>137</td>
<td>66.4</td>
<td>137</td>
<td>66.8</td>
<td>136</td>
<td>67.2</td>
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<td>394</td>
<td>26.6</td>
<td>394</td>
<td>26.6</td>
<td>385</td>
<td>27.2</td>
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<td>456.hmmer</td>
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<td>78.4</td>
<td>119</td>
<td>78.6</td>
<td>119</td>
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<td>78.4</td>
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<tr>
<td>458.sjeng</td>
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<td>30.3</td>
<td>399</td>
<td>30.3</td>
<td>399</td>
<td>30.3</td>
<td>391</td>
<td>30.9</td>
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<tr>
<td>462.libquantum</td>
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<td>6.21</td>
<td>3340</td>
<td>6.21</td>
<td>3340</td>
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<tr>
<td>464.h264ref</td>
<td>392</td>
<td>56.4</td>
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<td>56.5</td>
<td>393</td>
<td>56.3</td>
<td>392</td>
<td>56.4</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>268</td>
<td>23.3</td>
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<td>23.3</td>
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<td>23.2</td>
<td>221</td>
<td>28.3</td>
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<td>473.astar</td>
<td>232</td>
<td>30.3</td>
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<td>30.3</td>
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<td>30.3</td>
<td>233</td>
<td>30.2</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>110</td>
<td>63.0</td>
<td>110</td>
<td>63.0</td>
<td>109</td>
<td>63.0</td>
<td>98.7</td>
<td>69.9</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
- 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) running on rheil73-spec Fri Dec 8 21:29:19 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 4112 CPU @ 2.60GHz
- 2 "physical id"s (chips)
- 8 "processors"

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Platform Notes (Continued)
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 1 2 4 5
  physical 1: cores 0 1 3 4
  cache size : 8448 KB
From /proc/meminfo
  MemTotal: 394677756 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB
From /etc/*release*/etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.3 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="7.3"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
    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 rhel73-spec 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 8 21:27
SPEC is set to: /home/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb5 xfs 503G 24G 480G 5% /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, configured at 2400 MHz
(The correct amount of Memory installed is 384 GB (24 x 16 GB)
and the dmidecode is reporting invalid number of DIMMs installed

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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

Platform Notes (Continued)

Installed Memory:
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 = "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

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
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

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Cisco UCS C220 M5 (Intel Xeon Silver 4112, 2.60 GHz)  

| SPECint2006 | 59.0 |
| SPECint_base2006 | 56.5 |

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

### Base Optimization Flags (Continued)

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

### 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
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Silver 4112, 2.60 GHz)

SPEC CINT2006 Result

SPECint2006 = 59.0
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CPU2006 license: 9019
Test date: Dec-2017
Test sponsor: Cisco Systems
Hardware Availability: Aug-2017
Tested by: Cisco Systems
Software Availability: Apr-2017

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-callc
-qopt-malloc-options=3 -auto-ilp32

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

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)

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

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:
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Peak Other Flags (Continued)

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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