Cisco Systems
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

SPECint<sup>®</sup>2006 = 63.2
SPECint<sub>base</sub>2006 = 60.5

CPU2006 license: 9019
Test date: Aug-2016
Test sponsor: Cisco Systems
Hardware Availability: Apr-2016
Tested by: Cisco Systems
Software Availability: Dec-2015

CPU Name: Intel Xeon E5-2630 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip
CPU(s) orderable: 1.2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 25 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)
Disk Subsystem: 1 x 960 GB SSD SAS
Other Hardware: None

Software
Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64) 3.12.49-11-default
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE 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
Cisco Systems
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

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

**SPECint2006** = 63.2
**SPECint_base2006** = 60.5

---

**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>
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<tr>
<td>400.perlbench</td>
<td>265</td>
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<td>266</td>
<td>36.7</td>
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<td>401.bzip2</td>
<td>426</td>
<td>22.7</td>
<td>425</td>
<td>22.7</td>
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<td>22.7</td>
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<td>403.mcf</td>
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<td>34.8</td>
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<td>35.0</td>
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<tr>
<td>429.gcc</td>
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<td>63.2</td>
<td>145</td>
<td>62.7</td>
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<td>63.0</td>
<td>146</td>
<td>62.3</td>
<td>145</td>
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<tr>
<td>456.hmmer</td>
<td>122</td>
<td>76.4</td>
<td>122</td>
<td>76.5</td>
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<tr>
<td>462.libquantum</td>
<td>4.02</td>
<td>5160</td>
<td>4.02</td>
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<td>4.05</td>
<td>5120</td>
<td>4.02</td>
<td>5160</td>
<td>4.05</td>
<td>5120</td>
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<tr>
<td>464.h264ref</td>
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<td>51.5</td>
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<td>51.6</td>
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<td>51.5</td>
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<tr>
<td>471.omnetpp</td>
<td>194</td>
<td>32.2</td>
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<td>34.0</td>
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<td>33.9</td>
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<td>47.1</td>
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<tr>
<td>473.astar</td>
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<td>33.2</td>
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<td>212</td>
<td>33.1</td>
<td>212</td>
<td>33.1</td>
</tr>
<tr>
<td>483.xalancbmk</td>
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<td>67.7</td>
<td>101</td>
<td>68.6</td>
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<td>68.7</td>
<td>90.5</td>
<td>76.2</td>
<td>90.5</td>
<td>76.3</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 Hyper-Threading Technology option set to Disabled
- CPU performance set to Enterprise
- Power Technology set to Energy Efficient
- Energy Performance BIAS setting set to Balanced Performance
- Memory RAS configuration set to Maximum Performance
- Memory Power Saving Mode set to Disabled
- QPI Snoop Mode set to Home Directory Snoop with OSB

Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

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) CPU E5-2630 v4 @ 2.20GHz
- 2 "physical id"s (chips)

Continued on next page
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

SPECint2006 = 63.2
SPECint_base2006 = 60.5

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

Platform Notes (Continued)

20 "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 : 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 : 25600 KB

From /proc/meminfo
  MemTotal: 264569332 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 1
    # 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-SP1"
    VERSION_ID="12.1"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp1"

  uname -a:
    (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Aug 25 08:51

  SPEC is set to: /opt/cpu2006-1.2

  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda1 xfs 893G 13G 881G 2% /

  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. C220M4.2.0.10c.0.032320160810 03/23/2016
  Memory:
    16x 0xCE00 M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 MHz
    8x NO DIMM NO DIMM

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Cisco Systems
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

| SPECint2006 = | 63.2 |
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CPU2006 license: 9019
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Test date: Aug-2016
Hardware Availability: Apr-2016
Software Availability: Dec-2015

Platform Notes (Continued)
(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 = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"
OMP_NUM_THREADS = "20"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
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 -03 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
  -xCORE-AVX2 -ipo -03 -no-prec-div -opt-prefetch -auto-p32
  -Wl,-z,muldefs -L/sh -lsmartheap64
Cisco Systems
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

**SPEC2006 =** 63.2
**SPECint_base2006 =** 60.5

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**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_2016/linux/compiler/lib/ia32_lin`

445.gobmk: `icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

C++ benchmarks (except as noted below):

```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

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`

**Peak Optimization Flags**

C benchmarks:

```
400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch -ansi-alias
```

401.bzip2: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

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Cisco Systems
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

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Test date: Aug-2016
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Peak Optimization Flags (Continued)

401.bzip2 (continued):
   -opt-prefetch -ansi-alias

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

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

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias

456.hmmer: basepeak = yes

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -prof-use(pass 2)
   -opt-ra-region-strategy=block -ansi-alias
   -Wl,-z,muldefs -L/sh -lsmartheap

473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
   -auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
   -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap

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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revE.html
Cisco Systems
Cisco UCS C220 M4 (Intel Xeon E5-2630 v4, 2.20 GHz)

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**CPU2006 license:** 9019  
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You can also download the XML flags sources by saving the following links:
- http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
- http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revE.xml

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