Cisco Systems
Cisco UCS B200 M4 (Intel Xeon E5-2650 v3 @ 2.30GHz)

| SPECint®2006 | 56.3 |
| SPECint_base2006 | 54.1 |

CPU2006 license: 9019  
Test sponsor: Cisco Systems  
Tested by: Cisco Systems  
Hardware Availability: Sep-2014  
Software Availability: Jul-2014

Test date: Jan-2015

### Hardware

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-2650 v3</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.00 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2300</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>20 cores, 2 chips, 10 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>25 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x 600GB SAS, 10K RPM</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Red Hat Enterprise Linux Server release 7.0 (Maipo)</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>ext4</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software</td>
<td>Microquill SmartHeap V10.0</td>
</tr>
</tbody>
</table>
## 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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>278</td>
<td>35.2</td>
<td>280</td>
<td>34.9</td>
<td>280</td>
<td>34.9</td>
<td>243</td>
<td>40.2</td>
<td>243</td>
<td>40.3</td>
<td>243</td>
<td>40.2</td>
</tr>
<tr>
<td>403.mcf</td>
<td>262</td>
<td>30.7</td>
<td>261</td>
<td>30.8</td>
<td>262</td>
<td>30.8</td>
<td>255</td>
<td>31.6</td>
<td>256</td>
<td>31.5</td>
<td>255</td>
<td>31.5</td>
</tr>
<tr>
<td>429.gcc</td>
<td>164</td>
<td>55.6</td>
<td>163</td>
<td>55.8</td>
<td>162</td>
<td>56.2</td>
<td>162</td>
<td>56.1</td>
<td>162</td>
<td>56.3</td>
<td>165</td>
<td>55.3</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>423</td>
<td>24.8</td>
<td>424</td>
<td>24.7</td>
<td>423</td>
<td>24.8</td>
<td>423</td>
<td>24.8</td>
<td>423</td>
<td>24.8</td>
<td>423</td>
<td>24.8</td>
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<tr>
<td>456.hmmer</td>
<td>157</td>
<td>59.3</td>
<td>158</td>
<td>59.1</td>
<td>157</td>
<td>59.5</td>
<td>163</td>
<td>57.2</td>
<td>163</td>
<td>57.2</td>
<td>163</td>
<td>57.3</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>411</td>
<td>29.4</td>
<td>411</td>
<td>29.4</td>
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<td>29.4</td>
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<td>29.6</td>
<td>409</td>
<td>29.6</td>
<td>409</td>
<td>29.6</td>
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<tr>
<td>462.libquantum</td>
<td>3.77</td>
<td>5490</td>
<td>3.76</td>
<td>5510</td>
<td>3.84</td>
<td>5400</td>
<td>3.77</td>
<td>5490</td>
<td>3.76</td>
<td>5510</td>
<td>3.84</td>
<td>5400</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>526</td>
<td>42.1</td>
<td>521</td>
<td>42.5</td>
<td>520</td>
<td>42.6</td>
<td>526</td>
<td>42.1</td>
<td>521</td>
<td>42.5</td>
<td>520</td>
<td>42.6</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>221</td>
<td>28.3</td>
<td>214</td>
<td>29.2</td>
<td>213</td>
<td>29.4</td>
<td>153</td>
<td>41.0</td>
<td>152</td>
<td>41.1</td>
<td>154</td>
<td>40.7</td>
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<tr>
<td>473.astar</td>
<td>241</td>
<td>29.2</td>
<td>243</td>
<td>28.9</td>
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<td>28.9</td>
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<td>28.8</td>
<td>243</td>
<td>28.9</td>
<td>241</td>
<td>29.1</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>121</td>
<td>57.2</td>
<td>121</td>
<td>57.1</td>
<td>120</td>
<td>57.3</td>
<td>121</td>
<td>56.8</td>
<td>122</td>
<td>56.7</td>
<td>121</td>
<td>56.9</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

Intel Hyper-Threading Technology option set to Disabled
Power Technology set to Energy Efficient
CPU performance set to HPC
Energy Performance BIAS setting set to Balanced Performance
Memory RAS configuration set to Maximum Performance
QPI Snoop Mode set to Early Snoop
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6914
$Revision: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932eab81e28219e1
running on localhost.localdomain Mon Jan 19 20:49:33 2015

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 E5-2650 v3 @ 2.30GHz
2 "physical id"s (chips)  
20 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The Continued on next page
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Platform Notes (Continued)

following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
  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: 263706800 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.0 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="7.0"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
    ANSI_COLOR="0;31"
    CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
  redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
  Linux localhost.localdomain 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57
  EDT 2014 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 19 05:44

SPEC is set to: /opt/cpu2006-1.2
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sdb2    ext4 493G 15G 454G 4% /

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. B200M4.2.2.3c.0.101420141352 10/14/2014
  Memory:
    16x 0xCE00 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
    8x NO DIMM NO DIMM

(End of data from sysinfo program)
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General Notes
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
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 Core i5-4670K CPU + 16GB memory using RedHat EL 7.0
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1> /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
umactl --interleave=all runspec <etc>

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 -no-prec-div -parallel -opt-prefetch -auto-p32
C++ benchmarks:
   -xCORE-AVX2 -ipo -no-prec-div -opt-prefetch -auto-p32
   -Wl,-z,muldefs -L/sh -lsmartheap64

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
SPEC CINT2006 Result

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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/composer_xe_2015/lib/ia32
445.gobmk: icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

C++ benchmarks (except as noted below):
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
473.astar: icpc -m64

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -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
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

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

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div -prof-use(pass 2) -auto-ilp32
-opt-prefetch -ansi-alias

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Peak Optimization Flags (Continued)
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(pass 1) -prof-use(pass 2)
-ansi-alias

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
-ansi-alias

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4

462.libquantum: basepeak = yes
464.h264ref: basepeak = yes

C++ benchmarks:
471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -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

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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revC.xml
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