Cisco Systems
Cisco UCS B200 M4 (Intel Xeon E5-2697 v4, 2.30 GHz)

<table>
<thead>
<tr>
<th>SPECint2006 = 72.1</th>
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<tbody>
<tr>
<td>SPECint_base2006 = 70.3</td>
</tr>
</tbody>
</table>

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

Hardware
CPU Name: Intel Xeon E5-2697 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 36 cores, 2 chips, 18 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: 45 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 400 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

## SPECint2006 Result

<table>
<thead>
<tr>
<th>Test date:</th>
<th>Apr-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECint2006</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>44.5</td>
<td>37.5</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>25.3</td>
<td>18.0</td>
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<tr>
<td>403.gcc</td>
<td>37.5</td>
<td>29.5</td>
</tr>
<tr>
<td>429.mcf</td>
<td>61.4</td>
<td>30.4</td>
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<tr>
<td>445.gobmk</td>
<td>30.8</td>
<td>18.8</td>
</tr>
<tr>
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<td>88.2</td>
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<tr>
<td>462.libquantum</td>
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<td>73.5</td>
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<tr>
<td>464.h264ref</td>
<td>58.5</td>
<td>46.0</td>
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<tr>
<td>471.omnetpp</td>
<td>54.1</td>
<td>46.2</td>
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<tr>
<td>473.astar</td>
<td>36.6</td>
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<tr>
<td>483.xalancbmk</td>
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SPECint2006 = 72.1
## Results Table

<table>
<thead>
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<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
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<th>Ratio</th>
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<tr>
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<td>73.7</td>
<td>85.8</td>
<td>80.4</td>
<td></td>
<td></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/CISCO_Benchmarks/cpu2006/config/sysinfo.rev6914
  - $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
  - running on linux-nsg9 Wed Mar 30 00:51:17 2016

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 E5-2697 v4 @ 2.30GHz
  2 "physical id"s (chips)
```

Continued on next page
Cisco Systems
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CPU2006 license: 9019
Test sponsor: Cisco Systems
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Platform Notes (Continued)

36 "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 : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 46080 KB

From /proc/meminfo
MemTotal: 264367020 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP1

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 Mar 29 23:35

SPEC is set to: /opt/CISCO_Benchmarks/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 xfs 325G 13G 313G 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. B200M4.3.1.1.11.110420151758 11/04/2015
Continued on next page
Cisco Systems
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</table>

### Platform Notes (Continued)

Memory:
16x 0xCE00 M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz
8x NO DIMM NO DIMM

(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/CISCO_Benchmarks/cpu2006/libs/32:/opt/CISCO_Benchmarks/cpu2006/libs/64:/opt/CISCO_Benchmarks/cpu2006/sh*"
- `OMP_NUM_THREADS = "36"

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 -O3 -no-prec-div -parallel -opt-prefetch -auto-p32`

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### Base Optimization Flags (Continued)

C++ benchmarks:
- -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
- -Wl,-z,muldefs -L/sh -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_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
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Tested by: Cisco Systems

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Hardware Availability: Apr-2016
Software Availability: Dec-2015

Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-iipo(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)
-iipo(pass 2) -O3(pass 2) -no-prec-div
-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32
-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)
-iipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-iipo(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
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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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revD.html

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-revD.xml

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Tue May 3 18:01:36 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 3 May 2016.