Huawei 5288 V3 (Intel Xeon E5-2690 v4)

<table>
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<tr>
<th>SPECint®2006</th>
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<td>68.5</td>
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**CPU2006 license:** 3175  
**Test sponsor:** Huawei  
**Tested by:** Huawei  
**Test date:** Nov-2016  
**Hardware Availability:** Mar-2016  
**Software Availability:** Dec-2015

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<thead>
<tr>
<th>Tested by:</th>
<th>CPU Name:</th>
<th>CPU Characteristics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huawei</td>
<td>Intel Xeon E5-2690 v4</td>
<td>Intel Turbo Boost Technology up to 3.50 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2600</td>
</tr>
<tr>
<td></td>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td></td>
<td>CPU(s) enabled:</td>
<td>28 cores, 2 chips, 14 cores/chip</td>
</tr>
<tr>
<td></td>
<td>CPU(s) orderable:</td>
<td>1.2 chip</td>
</tr>
<tr>
<td></td>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td></td>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td></td>
<td>L3 Cache:</td>
<td>35 MB I+D on chip per chip</td>
</tr>
<tr>
<td></td>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Memory:</td>
<td>256 GB (16 x 16 GB 2Rx8 PC4-2400T-R)</td>
</tr>
<tr>
<td></td>
<td>Disk Subsystem:</td>
<td>1 x 800 GB SATA SSD</td>
</tr>
<tr>
<td></td>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

**Software**

| Operating System: | SUSE Linux Enterprise Server 12 SP1 (x86_64) |
|                   | 3.12.49-11-default |
| Compiler: | C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux |
| Auto Parallel: | Yes |
| File System: | ext4 |
| 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

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SPECint2006 = 71.6
SPECint_base2006 = 68.5

CPU2006 license: 3175
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Results Table

<table>
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<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>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>239</td>
<td>40.9</td>
<td>239</td>
<td>40.9</td>
<td>239</td>
<td>40.9</td>
<td>219</td>
<td>44.7</td>
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<td>44.6</td>
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<tr>
<td>401.bzip2</td>
<td>392</td>
<td>24.6</td>
<td>389</td>
<td>24.8</td>
<td>390</td>
<td>24.7</td>
<td>383</td>
<td>25.2</td>
<td>383</td>
<td>25.2</td>
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<tr>
<td>403.mcf</td>
<td>212</td>
<td>37.9</td>
<td>213</td>
<td>37.8</td>
<td>213</td>
<td>37.8</td>
<td>212</td>
<td>37.9</td>
<td>213</td>
<td>37.8</td>
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<tr>
<td>429.gcc</td>
<td>143</td>
<td>64.0</td>
<td>142</td>
<td>64.3</td>
<td>144</td>
<td>63.5</td>
<td>143</td>
<td>63.7</td>
<td>142</td>
<td>64.0</td>
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<tr>
<td>445.gobmk</td>
<td>348</td>
<td>30.1</td>
<td>348</td>
<td>30.1</td>
<td>348</td>
<td>30.1</td>
<td>348</td>
<td>30.1</td>
<td>348</td>
<td>30.1</td>
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<tr>
<td>456.hmmer</td>
<td>109</td>
<td>85.8</td>
<td>109</td>
<td>85.6</td>
<td>108</td>
<td>86.1</td>
<td>109</td>
<td>85.8</td>
<td>109</td>
<td>85.8</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>349</td>
<td>34.7</td>
<td>349</td>
<td>34.7</td>
<td>349</td>
<td>34.7</td>
<td>345</td>
<td>35.1</td>
<td>345</td>
<td>35.1</td>
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<tr>
<td>462.libquantum</td>
<td>2.85</td>
<td>7260</td>
<td>2.82</td>
<td>7350</td>
<td>2.84</td>
<td>7290</td>
<td>2.85</td>
<td>7260</td>
<td>2.82</td>
<td>7350</td>
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<tr>
<td>464.h264ref</td>
<td>383</td>
<td>57.8</td>
<td>383</td>
<td>57.8</td>
<td>382</td>
<td>57.9</td>
<td>383</td>
<td>57.8</td>
<td>383</td>
<td>57.8</td>
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<tr>
<td>471.omnetpp</td>
<td>147</td>
<td>42.5</td>
<td>148</td>
<td>42.2</td>
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<td>42.5</td>
<td>111</td>
<td>56.2</td>
<td>112</td>
<td>55.9</td>
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<tr>
<td>473.astar</td>
<td>193</td>
<td>36.4</td>
<td>193</td>
<td>36.4</td>
<td>193</td>
<td>36.4</td>
<td>193</td>
<td>36.4</td>
<td>194</td>
<td>36.2</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>92.2</td>
<td>74.9</td>
<td>91.9</td>
<td>75.1</td>
<td>91.6</td>
<td>75.3</td>
<td>81.9</td>
<td>84.3</td>
<td>81.1</td>
<td>85.0</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 configuration:
Set Power Efficiency Mode to Custom
Set Snoop Mode to ES mode
Set Patrol Scrub to Disable
Set Hyper-Threading to Disable
Sysinfo program /spec/spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-n8wl Tue Nov 15 13:41:08 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 E5-2690 v4@ 2.60GHz
2 "physical id"s (chips)
28 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with continued on next page
Huawei
Huawei 5288 V3 (Intel Xeon E5-2690 v4)

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Platform Notes (Continued)

cautions.)
cpu cores : 14
siblings : 14
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 35840 KB

From /proc/meminfo
MemTotal: 264055876 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:
Linux linux-n8wl 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Nov 15 08:47

SPEC is set to: /spec/spec16
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 ext4 632G 7.6G 623G 2% /spec

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 Insyde Corp. 3.31 08/22/2016
Memory:
16x Samsung M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz

(End of data from sysinfo program)
Huawei

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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 = "/spec/spec16/libs/32:/spec/spec16/libs/64:/spec/spec16/sh"
OMP_NUM_THREADS = "28"

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
runspec command invoked through numactl i.e.:
numactl --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 -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
  -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
  -Wl,-z,muldefs -L/sh -lsmartheap64
Huawei

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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

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: -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: -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-ilk32
-opt-prefetch -ansi-alias

Continued on next page
Huawei

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| SPECint2006 | 71.6 |
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Peak Optimization Flags (Continued)

403.gcc: basepeak = yes

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

445.gobmk: basepeak = yes

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) -unroll4

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

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

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/Huawei-Platform-Settings-BDW-V1.0.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/Huawei-Platform-Settings-BDW-V1.0.xml
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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 13 December 2016.