Huawei

Huawei CH222 V3 (Intel Xeon E5-2640 v4)

| SPECint®2006 = | 68.2 |
| SPECint_base2006 = | 64.8 |

CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei

Test date: Dec-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

| SPECint®2006 = 68.2 |
| SPECint_base2006 = 64.8 |

| SPECint®2006 = 68.2 |
| SPECint_base2006 = 64.8 |

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64) 3.12.49-11-default</td>
<td>CPU Name: Intel Xeon E5-2640 v4</td>
</tr>
<tr>
<td>Compiler: C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz</td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td>CPU MHz: 2400</td>
</tr>
<tr>
<td>File System: ext4</td>
<td>CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>CPU(s) orderable: 1.2 chip</td>
</tr>
<tr>
<td>Base Pointers: 32/64-bit</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
<td>L3 Cache: 25 MB I+D on chip per core</td>
</tr>
<tr>
<td></td>
<td>Other Cache: None</td>
</tr>
<tr>
<td></td>
<td>Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)</td>
</tr>
<tr>
<td></td>
<td>Disk Subsystem: 1 x 480 GB SATA SSD</td>
</tr>
<tr>
<td></td>
<td>Other Hardware: None</td>
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Hardware

Software

CPU Name: Intel Xeon E5-2640 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip
CPU(s) orderable: 1.2 chip
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 core
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)
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Other Hardware: None
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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>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>244</td>
<td>40.0</td>
<td>243</td>
<td>40.2</td>
<td>244</td>
<td>40.1</td>
<td>223</td>
<td>43.8</td>
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<td>43.8</td>
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<tr>
<td>401.bzip2</td>
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<td>24.8</td>
<td>388</td>
<td>24.9</td>
<td>392</td>
<td>24.6</td>
<td>383</td>
<td>25.2</td>
<td>383</td>
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<td>403.gcc</td>
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<td>37.4</td>
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<tr>
<td>429.mcf</td>
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<td>65.6</td>
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<td>66.2</td>
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<td>66.1</td>
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<td>66.4</td>
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<td>445.gobmk</td>
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<td>29.4</td>
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<td>3.85</td>
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<td>464.h264ref</td>
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<td>55.8</td>
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<td>55.4</td>
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<td>36.1</td>
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<td>36.2</td>
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<tr>
<td>483.xalancbmk</td>
<td>96.0</td>
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<td>93.9</td>
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<td>94.1</td>
<td>73.3</td>
<td>83.3</td>
<td>82.8</td>
<td>83.5</td>
<td>82.7</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 /spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on linux-1020 Mon Dec 5 05:59:29 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 E5-2640 v4 @ 2.40GHz
2 "physical id"s (chips)
20 "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
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Platform Notes (Continued)

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: 528829164 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 Dec 5 05:59

SPEC is set to: /spec16
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 ext4 394G 47G 347G 12% /

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 SMBOIS" standard.

BIOS Insyde Corp. 3.32 09/14/2016
Memory:
16x Hynix HMA84GR7MFR4N-UH 32 GB 2 rank 2400 MHz, configured at 2133 MHz
8x NO DIMM NO DIMM

(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 = "/spec16/libs/32:/spec16/libs/64:/spec16/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
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>
The Huawei CH121 V3 and Huawei CH222 V3
are electronically equivalent.
The results have been measured on a Huawei CH121 V3 model

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
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/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:threadsafepass 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:threadsafepass 1
-ipo(pass 2) -O3(pass 2) -no-prec-div
-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32
-opt-prefetch -ansi-alias

Continued on next page
**Huawei**

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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:threadsafepass 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:threadsafepass 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

---

**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/Huawei-Platform-Settings-BDW-V1.0.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/Huawei-Platform-Settings-BDW-V1.0.xml](http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-BDW-V1.0.xml)
Huawei

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

Tested with SPEC CPU2006 v1.2.
Originally published on 27 December 2016.