Huawei

Huawei CH220 V3 (Intel Xeon E5-2690 v4)

SPECfp®2006 = 117
SPECfp_base2006 = 111

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

Hardware

CPU Name: Intel Xeon E5-2690 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz: 2600
FPU: Integrated
CPU(s) enabled: 28 cores, 2 chips, 14 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

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;
Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext4
System State: Run level 3 (multi-user)
Huawei CH220 V3 (Intel Xeon E5-2690 v4)

**SPECfp2006 = 117**

**SPECfp_base2006 = 111**

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>3175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Huawei</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Huawei</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>35 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 2Rx8 PC4-2400T-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 800 GB SATA SSD</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>None</td>
</tr>
</tbody>
</table>

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>410.bwaves</td>
<td>26.4</td>
<td>514</td>
</tr>
<tr>
<td>416.gamess</td>
<td>499</td>
<td>39.2</td>
</tr>
<tr>
<td>433.milc</td>
<td>133</td>
<td>68.8</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>44.0</td>
<td>207</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>147</td>
<td>48.5</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>16.7</td>
<td>716</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>24.7</td>
<td>381</td>
</tr>
<tr>
<td>444.namd</td>
<td>261</td>
<td>30.7</td>
</tr>
<tr>
<td>447.dealII</td>
<td>177</td>
<td>64.6</td>
</tr>
<tr>
<td>450.soplex</td>
<td>177</td>
<td>47.1</td>
</tr>
<tr>
<td>453.povray</td>
<td>86.0</td>
<td>61.9</td>
</tr>
<tr>
<td>454.calculix</td>
<td>147</td>
<td>56.1</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>46.6</td>
<td>228</td>
</tr>
<tr>
<td>465.tonto</td>
<td>222</td>
<td>44.2</td>
</tr>
<tr>
<td>470.lbm</td>
<td>19.8</td>
<td>693</td>
</tr>
<tr>
<td>481.wrf</td>
<td>128</td>
<td>86.9</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>247</td>
<td>79.0</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

**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 HS mode
- Set Patrol Scrub to Disable
- Set Hyper-Threadining to Disable

Sysinfo program /spec/spec16/config/sysinfo.rev6914

$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on linux-n8wl Wed Nov 16 11:40:28 2016

This section contains SUT (System Under Test) info as seen by
Huawei

Huawei CH220 V3 (Intel Xeon E5-2690 v4)

SPECfp2006 = 117
SPECfp_base2006 = 111

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

<table>
<thead>
<tr>
<th>Test date:</th>
<th>Hardware Availability:</th>
<th>Software Availability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov-2016</td>
<td>Mar-2016</td>
<td>Dec-2015</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

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 caution.)
- 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 16 07:09

SPEC is set to: /spec/spec16

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>ext4</td>
<td>632G</td>
<td>7.6G</td>
<td>623G</td>
<td>2% /spec</td>
</tr>
</tbody>
</table>

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
Continued on next page
Huawei
Huawei CH220 V3 (Intel Xeon E5-2690 v4)

SPECfp2006 = 117
SPECfp_base2006 = 111

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

Platform Notes (Continued)

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)

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.:
umactl --interleave=all runspec <etc>

Base Compiler Invocation

C benchmarks:
icc   -m64
C++ benchmarks:
icpc  -m64
Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc   -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64

Continued on next page
Huawei

Huawei CH220 V3 (Intel Xeon E5-2690 v4)

| SPECfp2006 | 117 |
| SPECfp_base2006 | 111 |

CPU2006 license: 3175
Test date: Nov-2016
Test sponsor: Huawei
Hardware Availability: Mar-2016
Tested by: Huawei
Software Availability: Dec-2015

### Base Portability Flags (Continued)

<table>
<thead>
<tr>
<th>Base Portability Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>447.dealII: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>450.soplex: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>453.povray: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>454.calculix: -DSPEC_CPU_LP64 -nofor_main</td>
</tr>
<tr>
<td>459.GemsFDTD: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>465.tonto: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>470.lbm: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX</td>
</tr>
<tr>
<td>482.sphinx3: -DSPEC_CPU_LP64</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

- **C benchmarks**:
  - -xCORE-AVX2
  - -ipo
  - -O3
  - -no-prec-div
  - -parallel
  - -opt-prefetch
  - -ansi-alias

- **C++ benchmarks**:
  - -xCORE-AVX2
  - -ipo
  - -O3
  - -no-prec-div
  - -opt-prefetch
  - -ansi-alias

- **Fortran benchmarks**:
  - -xCORE-AVX2
  - -ipo
  - -O3
  - -no-prec-div
  - -parallel
  - -opt-prefetch

- **Benchmarks using both Fortran and C**:
  - -xCORE-AVX2
  - -ipo
  - -O3
  - -no-prec-div
  - -parallel
  - -opt-prefetch
  - -ansi-alias

### Peak Compiler Invocation

- **C benchmarks**:
  - icc -m64

- **C++ benchmarks**:
  - icpc -m64

- **Fortran benchmarks**:
  - ifort -m64

- **Benchmarks using both Fortran and C**:
  - icc -m64 ifort -m64

### Peak Portability Flags

Same as Base Portability Flags
C benchmarks:

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -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 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -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 2) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -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 2) -prof-use(pass 2) -unroll2
:inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes

459.GemsFDTD: -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 2) -prof-use(pass 2) -unroll2
:inline-level=0 -opt-prefetch -parallel

465.tonto: -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 2) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

Continued on next page
Huawei CH220 V3 (Intel Xeon E5-2690 v4)

**SPECfp2006 = 117**

**SPECfp_base2006 = 111**

**Huawei**

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

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

---

**Peak Optimization Flags (Continued)**

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

---

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)

---

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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.