Huawei CH121 V5 (Intel Xeon Gold 6134)

CPU2006 license: 3175
Test date: Jun-2017
Test sponsor: Huawei
Hardware Availability: Aug-2017
Tested by: Huawei
Software Availability: Nov-2016

SPECfp®2006 = 142
SPECfp_base2006 = 137

### Software

<table>
<thead>
<tr>
<th>Auto Parallel</th>
<th>File System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>xfs</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 6134</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHZ:</td>
<td>3200</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>16 cores, 2 chips, 8 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chip</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>1 MB I+D on chip per core</td>
</tr>
</tbody>
</table>

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SPEC CFP2006 Result

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CPU2006 license: 3175
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L3 Cache: 24.75 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 1200 GB SAS, 10000 RPM
Other Hardware: None
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Test date: Jun-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016

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>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>15.4</td>
<td>882</td>
<td>15.4</td>
<td>883</td>
<td>15.1</td>
<td>900</td>
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<tr>
<td>416.gamess</td>
<td>389</td>
<td>50.4</td>
<td>389</td>
<td>50.4</td>
<td>389</td>
<td>50.3</td>
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<tr>
<td>433.milc</td>
<td>120</td>
<td>76.7</td>
<td>120</td>
<td>76.7</td>
<td>120</td>
<td>76.7</td>
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<tr>
<td>434.zeusmp</td>
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<td>253</td>
<td>36.4</td>
<td>250</td>
<td>36.3</td>
<td>251</td>
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<td>435.gromacs</td>
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<td>65.5</td>
<td>109</td>
<td>65.5</td>
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<td>436.cactusADM</td>
<td>13.2</td>
<td>903</td>
<td>12.7</td>
<td>938</td>
<td>13.3</td>
<td>900</td>
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<td>437.leslie3d</td>
<td>20.5</td>
<td>458</td>
<td>20.1</td>
<td>469</td>
<td>20.5</td>
<td>459</td>
</tr>
<tr>
<td>444.namd</td>
<td>225</td>
<td>35.6</td>
<td>225</td>
<td>35.6</td>
<td>225</td>
<td>35.6</td>
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<tr>
<td>447.dealII</td>
<td>162</td>
<td>70.5</td>
<td>161</td>
<td>71.1</td>
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<td>70.4</td>
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<tr>
<td>450.soplex</td>
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<td>50.4</td>
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<td>50.5</td>
<td>163</td>
<td>51.2</td>
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<td>453.povray</td>
<td>76.7</td>
<td>69.3</td>
<td>76.8</td>
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<td>67.5</td>
<td>78.8</td>
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<td>454.calculix</td>
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<td>75.1</td>
<td>110</td>
<td>75.2</td>
<td>110</td>
<td>74.9</td>
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<td>459.GemsFDTD</td>
<td>43.1</td>
<td>246</td>
<td>42.3</td>
<td>251</td>
<td>41.3</td>
<td>257</td>
</tr>
<tr>
<td>465.tonto</td>
<td>168</td>
<td>58.5</td>
<td>167</td>
<td>58.8</td>
<td>168</td>
<td>58.6</td>
</tr>
<tr>
<td>470.lbm</td>
<td>15.0</td>
<td>916</td>
<td>15.3</td>
<td>896</td>
<td>14.8</td>
<td>929</td>
</tr>
<tr>
<td>481.wrf</td>
<td>90.4</td>
<td>124</td>
<td>90.4</td>
<td>124</td>
<td>90.2</td>
<td>124</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>229</td>
<td>84.9</td>
<td>230</td>
<td>84.7</td>
<td>230</td>
<td>84.6</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 Hyper-Threading to Disable
Sysinfo program /spec17/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runtime localhost.localdomain Wed Jun 7 06:08:24 2017

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

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Huawei

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**SPEC CFP2006 Result**

**SPECfp2006 =** 142

**SPECfp_base2006 =** 137

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**Platform Notes (Continued)**

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Gold 6134 CPU @ 3.20GHz
2 "physical id"s (chips)
16 "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 : 8
siblings : 8
physical 0: cores 0 2 3 9 16 19 26 27
physical 1: cores 0 2 3 9 16 19 26 27
cache size : 25344 KB
```

From /proc/meminfo

```
MemTotal:       394145204 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From /etc/*release* /etc/*version*

```
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
```

```
uname -a:
Linux localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13
EDT 2016 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Jun 6 13:18
```

SPEC is set to: /spec17

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 262G 87G 176G 34% /
```

**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. 0.10 02/14/2017**

**Memory:**

24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz

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**SPECfp2006 = 142**

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<tr>
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**Platform Notes (Continued)**

(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 = "/spec17/libs/32:/spec17/libs/64:/spec17/sh10.2"
- OMP_NUM_THREADS = "16"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent_hugepage/enabled
runcspec command invoked through numactl i.e.:

numactl --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
- 447.dealII: -DSPEC_CPU_LP64
- 450.soplex: -DSPEC_CPU_LP64
- 453.povray: -DSPEC_CPU_LP64
- 454.calculix: -DSPEC_CPU_LP64 -nofor_main
- 459.GemsFDTD: -DSPEC_CPU_LP64

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Base Portability Flags (Continued)

465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch

Fortran benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -qopt-prefetch

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

Peak Optimization Flags

C benchmarks:

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Peak Optimization Flags (Continued)

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

C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-
434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0
-qopt-prefetch -parallel
465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -inline-callloc -qopt-malloc-options=3
-auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

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<table>
<thead>
<tr>
<th>Huawei CH121 V5 (Intel Xeon Gold 6134)</th>
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### Peak Optimization Flags (Continued)

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html  
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml  
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.xml

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

Tested with SPEC CPU2006 v1.2.
