Huawei

Huawei XH321 V3 (Intel Xeon E5-2650L v4)

**SPECfp®2006 = 91.7**

**SPECfp_base2006 = 86.8**

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

<table>
<thead>
<tr>
<th><strong>CPU2006 license:</strong> 3175</th>
<th><strong>Test date:</strong> Dec-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test sponsor:</strong> Huawei</td>
<td><strong>Hardware Availability:</strong> Nov-2016</td>
</tr>
<tr>
<td><strong>Tested by:</strong> Huawei</td>
<td><strong>Software Availability:</strong> Nov-2015</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CPU Name:</strong></th>
<th>Intel Xeon E5-2650L v4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Characteristics:</strong></td>
<td>Intel Turbo Boost Technology up to 2.50 GHz</td>
</tr>
<tr>
<td><strong>CPU MHz:</strong></td>
<td>1700</td>
</tr>
<tr>
<td><strong>FPU:</strong></td>
<td>Integrated</td>
</tr>
<tr>
<td><strong>CPU(s) enabled:</strong></td>
<td>28 cores, 2 chips, 14 cores/chip</td>
</tr>
<tr>
<td><strong>CPU(s) orderable:</strong></td>
<td>1.2 chip</td>
</tr>
<tr>
<td><strong>Primary Cache:</strong></td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Secondary Cache:</strong></td>
<td>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Operating System:</strong></th>
<th>Red Hat Enterprise Linux Server release 7.2 (Maipo) 3.10.0-327.el7.x86_64</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compiler:</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Auto Parallel:</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>File System:</strong></td>
<td>ext4</td>
</tr>
</tbody>
</table>

**continued on next page**
Huawei

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

L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 64 GB (8 x 8 GB 2Rx8 PC4-2400T-R)
Disk Subsystem: 1 x 200 GB SATA SSD
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

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>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>26.1</td>
<td>522</td>
<td>25.2</td>
<td>539</td>
<td>25.8</td>
<td>527</td>
<td>26.1</td>
<td>522</td>
<td>25.2</td>
<td>539</td>
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<tr>
<td>416.gamess</td>
<td>770</td>
<td>25.4</td>
<td>768</td>
<td>25.5</td>
<td>769</td>
<td>25.4</td>
<td>638</td>
<td>30.7</td>
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<tr>
<td>433.milc</td>
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<td>59.7</td>
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<td>59.7</td>
<td>154</td>
<td>59.7</td>
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<td>434.zeusmp</td>
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<td>52.7</td>
<td>173</td>
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<td>54.0</td>
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<td>435.gromacs</td>
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<td>30.3</td>
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<td>30.3</td>
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<td>437.leslie3d</td>
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<td>330</td>
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<td>28.6</td>
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<tr>
<td>444.namd</td>
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<td>21.9</td>
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<tr>
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<td>48.3</td>
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<td>450.soplex</td>
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<td>38.0</td>
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<tr>
<td>453.povray</td>
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<td>41.0</td>
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<tr>
<td>459.GemsFDTD</td>
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<td>51.3</td>
<td>207</td>
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<td>211</td>
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<td>465.tonto</td>
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<td>28.3</td>
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<td>28.4</td>
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<td>39.7</td>
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<td>470.ibm</td>
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<td>683</td>
<td>19.5</td>
<td>704</td>
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<td>649</td>
<td>20.1</td>
<td>683</td>
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<tr>
<td>481.wrf</td>
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<td>72.1</td>
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<tr>
<td>482.sphinx3</td>
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<td>50.2</td>
<td>388</td>
<td>50.3</td>
<td>391</td>
<td>49.8</td>
<td>389</td>
<td>50.2</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-Threading to Disable
- Sysinfo program /spec16/config/sysinfo.rev6914
  - $Rev: 6914 $ $Date:: 2014-06-25 $ e3fbb8667b5a285932ceab81e28219e1
  - running on localhost.localdomain Thu Dec 29 11:40:50 2016

This section contains SUT (System Under Test) info as seen by...
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 E5-2650L v4@ 1.70GHz
   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:       65567964 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.2 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.2"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

uname -a:
   Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
   EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 29 11:39

SPEC is set to: /spec16
   Filesystem     Type Size Used Avail Use% Mounted on
   /dev/sda2      ext4  99G  7.2G  87G  8% /

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

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Platform Notes (Continued)

Memory:
8x Hynix HMA41GR7AFR8N-UH 8 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,1,0"
LD_LIBRARY_PATH = "/spec16/libs/32:/spec16/libs/64:/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

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
447.dealII: -DSPEC_CPU_LP64 -nofor_main
450.soplex: -DSPEC_CPU_LP64

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Base Portability Flags (Continued)

453.povray: -DSPEC_CPU_LP64  
454.calculix: -DSPEC_CPU_LP64 -nofor_main  
459.GemsFDTD: -DSPEC_CPU_LP64  
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 -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
Huawei

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SPECfp_base2006 = 86.8

Peak Optimization 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) -03(pass 2) -no-prec-div(pass 2)
         -par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
         -auto-ilp32

447.dealII: basepeak = yes
450.soplex: basepeak = yes

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
            -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2)
            -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
            -ansi-alias

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

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
              -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2)
              -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
              -inline-level=0 -scalar-rep-

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
          -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2)
          -par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc
          -opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-llp32 -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/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.