Huawei XH620 V3 (Intel Xeon E5-2698 v4)

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

| SPECfp®2006 = 116 |

| SPECfp_base2006 = 109 |

| SPECfp®2006 = 116 |

| SPECfp_base2006 = 109 |

### Hardware
- **CPU Name:** Intel Xeon E5-2698 v4  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.60 GHz  
- **CPU MHz:** 2200  
- **FPU:** Integrated  
- **CPU(s) enabled:** 40 cores, 2 chips, 20 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  
  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:** xfs  
- **System State:** Run level 3 (multi-user)
Huawei XH620 V3 (Intel Xeon E5-2698 v4)

SPEC CFP2006 Result

SPECfp2006 = 116
SPECfp_base2006 = 109

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L3 Cache: 50 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 1000GB SATA, 7200 RPM
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

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<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>25.9</td>
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<td>416.gamess</td>
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<td>444.namd</td>
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<td>447.dealII</td>
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<td><strong>20.1</strong></td>
<td><strong>683</strong></td>
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<td>696</td>
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<td><strong>127</strong></td>
<td><strong>87.7</strong></td>
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<td>482.sphinx3</td>
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<td>70.6</td>
<td><strong>278</strong></td>
<td><strong>70.1</strong></td>
<td>279</td>
<td>69.8</td>
<td>276</td>
<td>70.6</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 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 linux-6392 Wed Nov 2 11:03:33 2016

This section contains SUT (System Under Test) info as seen by
Continued on next page
Huawei

Huawei XH620 V3 (Intel Xeon E5-2698 v4)

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CPU2006 license: 3175
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Test date: Nov-2016
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Software Availability: Dec-2015

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 E5-2698 v4 @ 2.20GHz
2 "physical id"s (chips)
40 "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 : 20
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
cache size : 51200 KB

From /proc/meminfo
MemTotal: 528845004 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP1

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 Nov 2 11:02 last=5

SPEC is set to: /spec16
Filesystem Type Size Used Avail Use% Mounted on
/dev/md126p2 xfs 455G 23G 432G 5% /

Additional information from dmidecode:

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Huawei

Huawei XH620 V3 (Intel Xeon E5-2698 v4)  

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Platform Notes (Continued)

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 Micron 36ASF4G72PZ-2G3A1 32 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 = "/spec16/libs/32:/spec16/libs/64:/spec16/sh"  
OMP_NUM_THREADS = "40"

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  
runcpec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>

The Huawei XH622 V3 and Huawei XH628 V3 and Huawei XH620 V3 are electronically equivalent.  
The results have been measured on a Huawei XH620 V3 model.

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
Huawei
Huawei XH620 V3 (Intel Xeon E5-2698 v4)

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Base Portability Flags (Continued)

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 -nofor_main
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64 -nofor_main
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
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
Huawei

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Software Availability: Dec-2015

Peak Portability Flags

Same as Base Portability Flags

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) -O3(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
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 1) -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 1) -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 1) -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 1) -prof-use(pass 2) -inline-calloc

Continued on next page
Peak Optimization Flags (Continued)

465.tonto (continued):
- opt-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 -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.

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