Huawei

Huawei XH620 V3 (Intel Xeon E5-2680 v4)

SPECint®2006 = 68.1
SPECint_base2006 = 65.3

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

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

CPU Name: Intel Xeon E5-2680 v4
CPU Characteristics:
Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz: 2400
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
L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx8 PC4-2400T-R)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None

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
Auto Parallel: Yes
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2

Hardware

400.perlbench 42.2 38.8
401.bzip2 24.0 23.5
403.gcc 36.5
429.mcf 60.7
445.gobmk 28.5
456.hmmer 81.0
458.sjeng 32.2
462.libquantum
464.h264ref 55.1
471.omnetpp 54.1
473.astar 41.5
483.xalancbmk 34.8

6880

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Results Table

<table>
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<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>464.h264ref</td>
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<td>55.1</td>
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<tr>
<td>471.omnetpp</td>
<td>151</td>
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<td>473.astar</td>
<td>203</td>
<td>34.5</td>
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<td>34.5</td>
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<td>70.7</td>
<td>96.4</td>
<td>71.6</td>
<td>85.3</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 /spec/spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-n8wl Tue Nov 22 12:23:09 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 E5-2680 v4@ 2.40GHz
  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
Continued on next page
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Platform Notes (Continued)

cautions.)

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 22 12:13
SPEC is set to: /spec/spec16

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 ext4 632G 7.6G 623G 2% /spec

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. 3.31 08/22/2016
Memory:
16x Samsung M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz

(End of data from sysinfo program)
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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 = "/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.:
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

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
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
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
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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
473.astar: -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:threadsafe(pass 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:threadsafe(pass 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
## SPEC CINT2006 Result

**Huawei**

Huawei XH620 V3 (Intel Xeon E5-2680 v4)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>68.1</td>
</tr>
<tr>
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**CPU2006 license:** 3175  
**Test sponsor:** Huawei  
**Tested by:** Huawei  
**Test date:** Nov-2016  
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### Peak Optimization Flags (Continued)

<table>
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<th>Benchmark</th>
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</tr>
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<tbody>
<tr>
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<td>429.mcf</td>
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<td>445.gobmk</td>
<td>basepeak = yes</td>
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<tr>
<td>456.hmmer</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>-xCORE-AVX2(pass 2)</td>
</tr>
<tr>
<td></td>
<td>-prof-gen:threadsafe(pass 1)</td>
</tr>
<tr>
<td></td>
<td>-ipo(pass 2) -O3(pass 2)</td>
</tr>
<tr>
<td></td>
<td>-no-prec-div(pass 2)</td>
</tr>
<tr>
<td></td>
<td>-par-num-threads=1(pass 1)</td>
</tr>
<tr>
<td></td>
<td>-prof-use(pass 2) -unroll4</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>basepeak = yes</td>
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### C++ benchmarks:

<table>
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<th>Benchmark</th>
<th>Flags</th>
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<tbody>
<tr>
<td>471.omnetpp</td>
<td>-xCORE-AVX2(pass 2)</td>
</tr>
<tr>
<td></td>
<td>-prof-gen:threadsafe(pass 1)</td>
</tr>
<tr>
<td></td>
<td>-ipo(pass 2) -O3(pass 2)</td>
</tr>
<tr>
<td></td>
<td>-no-prec-div(pass 2)</td>
</tr>
<tr>
<td></td>
<td>-par-num-threads=1(pass 1)</td>
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<tr>
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<td>-prof-use(pass 2)</td>
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<td>-opt-ra-region-strategy=block</td>
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<tr>
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<td>-ansi-alias</td>
</tr>
<tr>
<td></td>
<td>-Wl,-z,muldefs -L/sh -lsmartheap</td>
</tr>
<tr>
<td>473.astar</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch</td>
</tr>
<tr>
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<td>-auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64</td>
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<tr>
<td>483.xalancbmk</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch</td>
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<tr>
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<td>-ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap</td>
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### Peak Other Flags

<table>
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<td>403.gcc</td>
<td>-Dalloca=_alloca</td>
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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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