Huawei
Huawei XH321 V3 (Intel Xeon E5-2699 v4)

SPECint®2006 = 73.4
SPECint_base2006 = 71.6

Hardware
- CPU Name: Intel Xeon E5-2699 v4
- CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
- CPU MHz: 2200
- FPU: Integrated
- CPU(s) enabled: 44 cores, 2 chips, 22 cores/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: 55 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 1000 GB SATA, 7200 RPM
- Other Hardware: None

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
- Auto Parallel: Yes
- File System: xfs
- System State: Run level 3 (multi-user)
- Base Pointers: 32/64-bit
- Peak Pointers: 32/64-bit
- Other Software: Microquill SmartHeap V10.2
## SPEC CINT2006 Result

### Huawei

**Huawei XH321 V3 (Intel Xeon E5-2699 v4)**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>235</td>
<td>41.6</td>
<td>233</td>
<td>41.5</td>
<td>236</td>
<td>41.5</td>
<td>214</td>
<td>45.7</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>384</td>
<td>25.1</td>
<td>384</td>
<td>25.1</td>
<td>384</td>
<td>25.1</td>
<td>382</td>
<td>25.2</td>
</tr>
<tr>
<td>403.gcc</td>
<td><strong>208</strong></td>
<td>38.6</td>
<td>208</td>
<td>38.6</td>
<td>208</td>
<td>38.6</td>
<td>210</td>
<td>38.4</td>
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<tr>
<td>429.mcf</td>
<td>139</td>
<td>65.8</td>
<td>139</td>
<td>65.6</td>
<td>143</td>
<td>63.8</td>
<td>139</td>
<td>65.8</td>
</tr>
<tr>
<td>445.gobmk</td>
<td><strong>342</strong></td>
<td>30.7</td>
<td>342</td>
<td>30.7</td>
<td>341</td>
<td>30.7</td>
<td><strong>342</strong></td>
<td><strong>30.7</strong></td>
</tr>
<tr>
<td>456.hmmer</td>
<td>107</td>
<td>86.9</td>
<td>107</td>
<td>87.5</td>
<td>107</td>
<td>87.5</td>
<td>107</td>
<td>86.9</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>335</td>
<td>36.1</td>
<td>334</td>
<td>36.2</td>
<td><strong>335</strong></td>
<td><strong>36.2</strong></td>
<td>330</td>
<td>36.6</td>
</tr>
<tr>
<td>462.libquantum</td>
<td><strong>2.54</strong></td>
<td><strong>8170</strong></td>
<td>2.55</td>
<td>8120</td>
<td>2.52</td>
<td>8220</td>
<td><strong>2.54</strong></td>
<td><strong>8170</strong></td>
</tr>
<tr>
<td>464.h264ref</td>
<td>382</td>
<td>57.9</td>
<td>381</td>
<td>58.0</td>
<td><strong>382</strong></td>
<td><strong>58.0</strong></td>
<td>382</td>
<td>57.9</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td><strong>124</strong></td>
<td><strong>50.4</strong></td>
<td>124</td>
<td>50.5</td>
<td>127</td>
<td>49.3</td>
<td><strong>112</strong></td>
<td><strong>55.9</strong></td>
</tr>
<tr>
<td>473.astar</td>
<td><strong>189</strong></td>
<td><strong>37.1</strong></td>
<td>190</td>
<td>37.0</td>
<td>188</td>
<td>37.4</td>
<td><strong>189</strong></td>
<td><strong>37.1</strong></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>86.7</td>
<td>79.6</td>
<td>87.7</td>
<td>78.7</td>
<td><strong>86.7</strong></td>
<td><strong>79.5</strong></td>
<td>79.5</td>
<td>86.8</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 /spec16/config/sysinfo.rev6914
  - $Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
  - running on linux-6392 Tue Nov  8 18:00:01 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 E5-2699 v4 @ 2.20GHz
- 2 "physical id"s (chips)
- 44 "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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CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei

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

Platform Notes (Continued)

caution.)
cpu cores : 22
siblings : 22
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
28

cache size : 56320 KB

From /proc/meminfo
MemTotal: 528844588 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 8 08:34 last=5

SPEC is set to: /spec16
Filesystem Type Size Used Avail Use% Mounted on
/dev/md126p2 xfs 455G 25G 431G 6% /

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
Memory:

Continued on next page
Huawei

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Platform Notes (Continued)

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 = "44"

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

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
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
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

Continued on next page
**SPEC CINT2006 Result**

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**Base Optimization Flags (Continued)**

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-1w,-z,muldefs -L/sh -1smartheap64

---

**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
458.sjeng: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
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:

Continued on next page
Huawei XH321 V3 (Intel Xeon E5-2699 v4)

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**Peak Optimization Flags (Continued)**

### 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`

### 403.gcc

### 429.mcf
- `basepeak = yes`

### 445.gobmk
- `basepeak = yes`

### 456.hmmer
- `basepeak = yes`

### 458.sjeng
- `–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`

### 462.libquantum
- `basepeak = yes`

### 464.h264ref
- `basepeak = yes`

---

**Peak Other Flags**

### C benchmarks

### 403.gcc
- `–Dalloca=_alloca`
## SPEC CINT2006 Result

### Huawei

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</table>

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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)

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

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