Huawei XH622 V3 (Intel Xeon E5-2697 v4)

**SPECfp®2006 = 116**

**SPECfp_base2006 = 109**

**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 E5-2697 v4

**CPU Characteristics:** Intel Turbo Boost Technology up to 3.60 GHz

**CPU MHz:** 2300

**FPU:** Integrated

**CPU(s) enabled:** 36 cores, 2 chips, 18 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

**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 XH622 V3 (Intel Xeon E5-2697 v4)**

**CPU2006 license:** 3175  
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**L3 Cache:** 45 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  
**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>
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<tbody>
<tr>
<td>410.bwaves</td>
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<td>24.5</td>
<td>556</td>
<td><strong>24.6</strong></td>
<td><strong>551</strong></td>
<td>26.7</td>
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<tr>
<td>416.gamess</td>
<td>491</td>
<td>39.8</td>
<td>495</td>
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<td><strong>492</strong></td>
<td><strong>39.8</strong></td>
<td>414</td>
<td>47.3</td>
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<tr>
<td>433.milc</td>
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<td>130</td>
<td>70.4</td>
<td><strong>130</strong></td>
<td><strong>70.9</strong></td>
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<td>434.zeusmp</td>
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<td><strong>45.6</strong></td>
<td><strong>199</strong></td>
<td>46.1</td>
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<td>435.gromacs</td>
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<td>45.3</td>
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<td><strong>45.2</strong></td>
<td>161</td>
<td>44.4</td>
<td>158</td>
<td>45.3</td>
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<tr>
<td>436.cactusAD</td>
<td><strong>175</strong></td>
<td>682</td>
<td>17.4</td>
<td>687</td>
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<td>437.leslie3d</td>
<td>24.6</td>
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<td>447.dealII</td>
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<td>450.soplex</td>
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<td>453.povray</td>
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<td>454.calculix</td>
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<td>254</td>
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<td>465.tonto</td>
<td>238</td>
<td>41.4</td>
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<td>41.5</td>
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<td><strong>41.4</strong></td>
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<td>470.lbm</td>
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<td><strong>21.2</strong></td>
<td><strong>647</strong></td>
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<td>694</td>
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<td>637</td>
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<td>481.wrf</td>
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<td>86.0</td>
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<td>86.1</td>
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<td><strong>86.0</strong></td>
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<td>482.sphinx3</td>
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<td>72.1</td>
<td>270</td>
<td>72.3</td>
<td>271</td>
<td>71.9</td>
<td><strong>270</strong></td>
<td><strong>72.1</strong></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 `/spec/spec16/config/sysinfo.rev6914`  
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1  
running on linux-c3qu Wed Nov 16 10:02:31 2016

This section contains SUT (System Under Test) info as seen by

Continued on next page
Huawei

Huawei XH622 V3 (Intel Xeon E5-2697 v4)

SPECfp2006 = 116
SPECfp_base2006 = 109

CPU2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei
Test date: Nov-2016
Hardware Availability: Mar-2016
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 E5-2697 v4 @ 2.30GHz
   2 "physical id"s (chips)
   36 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 46080 KB

From /proc/meminfo
MemTotal:       264059648 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 16 01:00

SPEC is set to: /spec/spec16
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda3      xfs  641G  7.6G  634G  2%  /spec
Additional information from dmidecode:

Continued on next page
### SPEC CFP2006 Result

**Huawei**

**Huawei XH622 V3 (Intel Xeon E5-2697 v4)**

<table>
<thead>
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**CPU2006 license:** 3175

**Test sponsor:** Huawei

**Test date:** Nov-2016

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**Hardware Availability:** Mar-2016

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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 Samsung M393A2K43BB1-CRC 16 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 = "/spec/spec16/libs/32:/spec/spec16/libs/64:/spec/spec16/sh"
- OMP_NUM_THREADS = "36"

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/transient_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

- 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

Continued on next page
Huawei XH622 V3 (Intel Xeon E5-2697 v4)

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**Software Availability:** Dec-2015

---

**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
- 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
Huawei XH622 V3 (Intel Xeon E5-2697 v4)

SPECfp2006 = 116
SPECfp_base2006 = 109

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Hardware Availability: Mar-2016
Tested by: Huawei
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

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
Huawei

**Huawei XH622 V3 (Intel Xeon E5-2697 v4)**

| SPECfp2006 = | 116 |
| SPECfp_base2006 = | 109 |

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---

### 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/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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