Huawei

Huawei CH222 V3 (Intel Xeon E5-2603 v4)

**SPECfp®_rate2006 = 353**

**SPECfp_rate_base2006 = 347**

<table>
<thead>
<tr>
<th>Copy</th>
<th>Intel Xeon E5-2603 v4 (Intel Xeon E5-2603 v4)</th>
<th>Test date: Nov-2016</th>
</tr>
</thead>
</table>

**CPU2006 license:** 3175

**Test sponsor:** Huawei

**Tested by:** Huawei

**Hardware Availability:** Mar-2016

**Software Availability:** Nov-2015

**Software**

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

**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:** No

**File System:** xfs

---

**Hardware**

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2603 v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td></td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1700</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>12 cores, 2 chips, 6 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chip</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

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Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
Huawei CH222 V3 (Intel Xeon E5-2603 v4) SPEC CFP2006 Result

**SPECfp_rate2006 = 353**

**SPECfp_rate_base2006 = 347**

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

L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 1866 MHz)
Disk Subsystem: 1 x 1000 GB SATA, 7200 RPM
Other Hardware: None

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>12</td>
<td>379</td>
<td>431</td>
<td>1.00</td>
<td>12</td>
<td>379</td>
<td>431</td>
</tr>
<tr>
<td>416.gamess</td>
<td>12</td>
<td>899</td>
<td>261</td>
<td>3.50</td>
<td>12</td>
<td>867</td>
<td>271</td>
</tr>
<tr>
<td>433.milc</td>
<td>12</td>
<td>251</td>
<td>438</td>
<td>0.57</td>
<td>12</td>
<td>251</td>
<td>438</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>12</td>
<td>278</td>
<td>392</td>
<td>0.72</td>
<td>12</td>
<td>278</td>
<td>392</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>12</td>
<td>285</td>
<td>301</td>
<td>0.94</td>
<td>12</td>
<td>271</td>
<td>316</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>12</td>
<td>257</td>
<td>559</td>
<td>0.46</td>
<td>12</td>
<td>257</td>
<td>559</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>12</td>
<td>346</td>
<td>326</td>
<td>1.05</td>
<td>12</td>
<td>346</td>
<td>326</td>
</tr>
<tr>
<td>444.namd</td>
<td>12</td>
<td>535</td>
<td>180</td>
<td>2.97</td>
<td>12</td>
<td>521</td>
<td>185</td>
</tr>
<tr>
<td>447.dealII</td>
<td>12</td>
<td>341</td>
<td>403</td>
<td>0.85</td>
<td>12</td>
<td>341</td>
<td>403</td>
</tr>
<tr>
<td>450.soplex</td>
<td>12</td>
<td>412</td>
<td>243</td>
<td>1.70</td>
<td>12</td>
<td>412</td>
<td>243</td>
</tr>
<tr>
<td>453.povray</td>
<td>12</td>
<td>178</td>
<td>359</td>
<td>0.51</td>
<td>12</td>
<td>157</td>
<td>408</td>
</tr>
<tr>
<td>454.calculix</td>
<td>12</td>
<td>260</td>
<td>381</td>
<td>0.68</td>
<td>12</td>
<td>260</td>
<td>381</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>12</td>
<td>489</td>
<td>261</td>
<td>1.87</td>
<td>12</td>
<td>489</td>
<td>261</td>
</tr>
<tr>
<td>465.tonto</td>
<td>12</td>
<td>380</td>
<td>311</td>
<td>1.22</td>
<td>12</td>
<td>353</td>
<td>335</td>
</tr>
<tr>
<td>470.lbm</td>
<td>12</td>
<td>302</td>
<td>545</td>
<td>0.56</td>
<td>12</td>
<td>302</td>
<td>545</td>
</tr>
<tr>
<td>481.wrf</td>
<td>12</td>
<td>323</td>
<td>415</td>
<td>0.78</td>
<td>12</td>
<td>323</td>
<td>415</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>12</td>
<td>724</td>
<td>323</td>
<td>2.27</td>
<td>12</td>
<td>724</td>
<td>323</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

**Submit Notes**

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

**Operating System Notes**

Stack size set to unlimited using "ulimit -s unlimited"

**Platform Notes**

BIOS configuration:
Set Power Efficiency Mode to Performance
Set Snoop Mode to ES mode
**Platform Notes (Continued)**

Set Patrol Scrub to Disable
Baseboard Management Controller used to adjust the fan speed to 100%
Sysinfo program /spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1 running on localhost.localdomain Fri Nov 25 18:42:06 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 E5-2603 v4 @ 1.70GHz
2 "physical id"s (chips)
12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5
physical 1: cores 0 1 2 3 4 5
cache size : 15360 KB

From /proc/meminfo
MemTotal:       527795096 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
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 Nov 25 09:09

SPEC is set to: /spec16
Filesyste Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 911G 154G 757G 17% /

Additional information from dmidecode:
Continued on next page
Huawei CH222 V3 (Intel Xeon E5-2603 v4)

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CPU2006 license: 3175  
Test date: Nov-2016  
Test sponsor: Huawei  
Hardware Availability: Mar-2016  
Tested by: Huawei  
Software Availability: Nov-2015

**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. 3.32 09/14/2016  
Memory:  
8x NO DIMM NO DIMM  
16x Samsung M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz, configured at 1867 MHz

(End of data from sysinfo program)

**General Notes**

Environment variables set by runspec before the start of the run:  
LD_LIBRARY_PATH = "/spec16/libs/32:/spec16/libs/64:/spec16/sh"

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  
Filesystem page cache cleared with:  
echo 1>/proc/sys/vm/drop_caches  
runcpec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>  
The Huawei CH121 V3 and Huawei CH222 V3  
are electronically equivalent.  
The results have been measured on a Huawei CH121 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
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Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.games: -DSPEC_CPU_LP64
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
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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:
icc -m64
C++ benchmarks:
icpc -m64
Fortran benchmarks:
ifort -m64

Continued on next page
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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
  icc   -m64 ifort -m64

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) -opt-mem-layout-trans=3(pass 2)
            -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) -opt-mem-layout-trans=3(pass 2)
               -prof-use(pass 2) -unroll14 -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
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Huawei CH222 V3 (Intel Xeon E5-2603 v4)

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SPECfp_rate_base2006 = 347

CPU2006 license: 3175
Test sponsor: Huawei
Test date: Nov-2016
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Hardware Availability: Mar-2016
Software Availability: Nov-2015

Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes
   -xCORE-AVX2(pass 2) -prof-gen:threadsafepass 1
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4 -auto
   -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen:threadsafepass 1
   -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
   -par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
   -prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes
454.calculix: basepeak = yes
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 other inquiries, please contact webmaster@spec.org.

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