Huawei CH121 V3 (Intel Xeon E5-2698 v4) SPECfp\textsuperscript{®}2006 = NC
SPECfp\textsubscript{base}2006 = NC

<table>
<thead>
<tr>
<th>SPEC Application</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td></td>
</tr>
<tr>
<td>444.namd</td>
<td></td>
</tr>
<tr>
<td>447.dealII</td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td></td>
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<tr>
<td>453.povray</td>
<td></td>
</tr>
<tr>
<td>454.calculix</td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td></td>
</tr>
</tbody>
</table>

SPEC has determined that this result is not in compliance with the SPEC CPU2006 run and reporting rules. Specifically, the memory was not available as required by SPEC CPU rule 1.3.2 and the SPEC Open Systems Group policy on general availability.
**SPEC CFP2006 Result**

Huawei

Huawei CH121 V3 (Intel Xeon E5-2698 v4)

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>NC</td>
</tr>
</tbody>
</table>

CP2006 license: 3175
Test sponsor: Huawei
Tested by: Huawei
Test date: Feb-2016
Hardware Availability: Mar-2016
Software Availability: Mar-2016

SPEC has determined that this result is not in compliance with the SPEC CPU2006 run and reporting rules. Specifically, the memory was not available as required by SPEC CPU rule 1.3.2 and the SPEC Open Systems Group policy on general availability.

### Hardware

<table>
<thead>
<tr>
<th><strong>CPU Name</strong></th>
<th>Intel Xeon E5-2698 v4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Characteristics</strong></td>
<td>Intel Turbo Boost Technology up to 3.60 GHz</td>
</tr>
<tr>
<td><strong>CPU MHz</strong></td>
<td>2200</td>
</tr>
<tr>
<td><strong>FPU</strong></td>
<td>Integrated</td>
</tr>
<tr>
<td><strong>CPU(s) enabled</strong></td>
<td>40 cores, 2 chips, 20 cores/chip</td>
</tr>
<tr>
<td><strong>CPU(s) orderable</strong></td>
<td>1.2 chip</td>
</tr>
<tr>
<td><strong>Primary Cache</strong></td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Secondary Cache</strong></td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3 Cache</strong></td>
<td>50 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other Cache</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)</td>
</tr>
<tr>
<td><strong>Disk Subsystem</strong></td>
<td>1 x 600GB SAS, 10000 RPM</td>
</tr>
<tr>
<td><strong>Other Hardware</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

| **Operating System** | Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64 |
| **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) |
| **Base Pointers** | 64-bit |
| **Ped Pointers** | 32/64-bit |
| **Other Software** | None |
Huawei

Huawei CH121 V3 (Intel Xeon E5-2698 v4)

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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 localhost.localdomain Tue Nov 18 06:37:08 2014
Continued on next page

Non-Compliant
Huawei

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Software Availability: Mar-2016

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Platform Notes (Continued)

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, set:
http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
- model name : Intel(R) Xeon(R) CPU E5-2698  8.2.20GHz
- 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 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  - physical 1: cores 0 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:       263568392 kB
- HugePages_Total:       0
- Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
- NAME="Red Hat Enterprise Linux Server"
- VERSION="7.0 (Maipo)"
- ID="rhel"
- ID_LIKE="fedora"
- VERSION_ID="7.0"
- PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
- CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
- Redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
- system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
- system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
- Linux localhost.localdomain 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 18 02:03
SPEC is set to: /spec/spec16

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SPEC CFP2006 Result

Huawei

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Platform Notes (Continued)

Filesystem     Type  Size  Used  Avail Use% Mounted on
/dev/sda2      xfs   549G   14G  536G   3% /

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 if there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Insyde Corp. 3.09 02/22/2016
Memory:
8x NO DIMM NO DIMM 3 rank
8x Samsung M393A2G40EB1-CRC 16 GB 1 rank 2400 MHz
8x Samsung M393A2G40EB1-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 = "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
runspec command invoked through numacli i.e.:
numactl --interleave=all runspec <etc>
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

Continued on next page
Huawei

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Base Compiler Invocation (Continued)

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
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 -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

Continued on next page
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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
433.milc: basepeak = yes
70.1bm: 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

Continued on next page
Peak Optimization Flags (Continued)

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 1) -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 
-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

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