Huawei CH121 V3 (Intel Xeon E5-2643 v4)

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

**Test date:** Mar-2016  
**Hardware Availability:** Mar-2016  
**Software Availability:** Mar-2016

**SPECfp**-rate2006 = NC  
**SPECfp_rate_base2006 = NC**

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### Copies

| 410.bwaves | 416.gamess | 433.milc | 434.zeusmp | 435.gromacs |
| 436.cactusADM | 437.leslie3d | 444.namd | 447.dealII | 450.soplex |
| 453.povray | 454.calculix | 459.GemsFDTD | 465.tonto | 481.wrf |
| 482.sphinx3 |
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<th>NC</th>
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<tr>
<td>SPECfp_rate_base2006</td>
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### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2643 v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>3400</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>12 cores, 2 chips, 6 cores/chip, 2 threads/core</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>
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<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>20 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 1 T SATA, 7200 RPM</td>
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<tr>
<td>Other Hardware:</td>
<td>None</td>
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</tbody>
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### Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>Red Hat Enterprise Linux Server release 7.0 (Maipo)</th>
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</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>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</td>
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<tr>
<td>Auto Parallel:</td>
<td>No</td>
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<tr>
<td>File System:</td>
<td>ext4</td>
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<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Ped Pointer:</td>
<td>32/64-bit</td>
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<td>Other Software:</td>
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Huawei CH121 V3 (Intel Xeon E5-2643 v4)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>410.bwaves</td>
<td>24</td>
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<td>NC</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
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<td>NC</td>
<td>NC</td>
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<td>NC</td>
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</table>

**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"
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CPU2006 license: 3175
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Test sponsor: Huawei
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Platform Notes

BIOS configuration:
Set Power Efficiency Mode to Performance
Set Snoop Mode to ES mode
Set Patrol Scrub to Disable
Sysinfo program /speccpu/spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb66 6a2855c2eceb81e28219e1
running on localhost.localdomain Thu Mar 24 11:30:33 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 E5-2643 v4 @ 3.40GHz
  2 "physical id"s (chips)
  24 "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 : 6
siblings  : 12
  physical 0: cores 1 2 3 6 7
  physical 1: cores 0 2 3 6 7
cache size : 20480 KB

From /proc/meminfo
MemTotal: 66570248 kB
B HogPages_Total: 0

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)"
ANSI_COLOR="0;31"
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

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available as required by <a href="http://spec.org/cpu2006/Docs/runrules.html#rule_1.3.2">SPEC CPU rule 1.3.2</a> and the SPEC
Open Systems Group policy on <a href="https://www.spec.org/osg/policy.html#AppendixC">general
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Non-compliant
Huawei

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Platform Notes (Continued)

uname -a:
    Linux localhost.localdomain 3.10.0-123.el7.x86_64 #1 SMP Wed May 5 11:16:57 EDT 2014 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Mar 23 05:59

SPEC is set to: /speccpu/spec16
    Filesystem  Type Size  Used Avail Use% Mounted on
    /dev/sda2      ext4  865G   53G  769G   7% /

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. 3.09 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

General Notes

Environment variables set by runspec before the start of the run:
LD_LBD32_PY_PATH = "/speccpu/spec16/libs/32:/speccpu/spec16/libs/64:/speccpu/spec16/sh"

    Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
    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
    runspec 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
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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.gameess -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 -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 -nofor_main`
- `465.tonto -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX`
- `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`
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<tr>
<th>Test sponsor:</th>
<th>Huawei</th>
<th>HW Availability:</th>
<th>Mar-2016</th>
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<td>Tested by:</td>
<td>Huawei</td>
<td>SW Availability:</td>
<td>Mar-2016</td>
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### Base Optimization Flags (Continued)

- **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`

- **Benchmarks using both C and Fortran:**
  - `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`

Continued on next page
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Peak Optimization Flags (Continued)

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) -O3(pass 2) -auto-ilp32 -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
446.GemsFDTD: basepeak = yes
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) -unroll4 -auto
           -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -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) -opt-prefetch -auto-ilp32

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Peak Optimization Flags (Continued)

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<thead>
<tr>
<th>Flag</th>
<th>Basepeak</th>
</tr>
</thead>
<tbody>
<tr>
<td>436.cactusADM</td>
<td>yes</td>
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<tr>
<td>454.calculix</td>
<td>yes</td>
</tr>
<tr>
<td>481.wrf</td>
<td>yes</td>
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</tbody>
</table>

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

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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