### SPEC® CFP2006 Result

**Huawei**

Huawei 2288H V5 (Intel Xeon Platinum 8156)

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>123</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>121</td>
</tr>
</tbody>
</table>

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

**Test date:** Jul-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Nov-2016

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>52.9</td>
</tr>
<tr>
<td>416.gamess</td>
<td>50.2</td>
</tr>
<tr>
<td>433.milc</td>
<td>77.7</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>220</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>68.7</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>309</td>
</tr>
<tr>
<td>444.namd</td>
<td>36.6</td>
</tr>
<tr>
<td>447.dealII</td>
<td>71.1</td>
</tr>
<tr>
<td>450.soplex</td>
<td>47.1</td>
</tr>
<tr>
<td>453.povray</td>
<td>78.1</td>
</tr>
<tr>
<td>454.calculix</td>
<td>69.4</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>201</td>
</tr>
<tr>
<td>465.tonto</td>
<td>67.2</td>
</tr>
<tr>
<td>470.lbm</td>
<td>60.1</td>
</tr>
<tr>
<td>481.wrf</td>
<td>98.1</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>90.5</td>
</tr>
</tbody>
</table>

**SPECfp_base2006 = 121**

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8156  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz  
- **CPU MHz:** 3600  
- **FPU:** Integrated  
- **CPU(s) enabled:** 8 cores, 2 chips, 4 cores/chip  
- **CPU(s) orderable:** 1.2 chip  
- **Primary Cache:** 32 KB I + 32 KB D on chip per core  
- **Secondary Cache:** 1 MB I+D on chip per core

**Software**

- **Operating System:** Red Hat Enterprise Linux Server release 7.3 (Maipo)  
  3.10.0-514.el7.x86_64  
- **Compiler:** C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux
- **Auto Parallel:** Yes  
- **File System:** xfs

Continued on next page
SPEC CFP2006 Result

Huawei

Huawei 2288H V5 (Intel Xeon Platinum 8156)

SPECfp2006 = 123
SPECfp_base2006 = 121

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

L3 Cache: 16.5 MB I+D on chip per chip
Other Cache: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 1 x 1200 GB SAS, 10000 RPM
Other Hardware: None
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Test date: Jul-2017
Hardware Availability: Sep-2017
Software Availability: Nov-2016

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>410.bwaves</td>
<td>24.9</td>
<td>546</td>
</tr>
<tr>
<td>416.gamess</td>
<td>389</td>
<td>50.3</td>
</tr>
<tr>
<td>433.milc</td>
<td>118</td>
<td>77.7</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>104</td>
<td>68.7</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>17.0</td>
<td>704</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>30.4</td>
<td>309</td>
</tr>
<tr>
<td>444.namd</td>
<td>224</td>
<td>35.7</td>
</tr>
<tr>
<td>447.dealII</td>
<td>161</td>
<td>71.1</td>
</tr>
<tr>
<td>450.soplex</td>
<td>177</td>
<td>47.0</td>
</tr>
<tr>
<td>453.povray</td>
<td>76.9</td>
<td>69.2</td>
</tr>
<tr>
<td>454.calculix</td>
<td>108</td>
<td>76.6</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>55.9</td>
<td>190</td>
</tr>
<tr>
<td>460.tonto</td>
<td>164</td>
<td>60.1</td>
</tr>
<tr>
<td>470.lbm</td>
<td>25.3</td>
<td>544</td>
</tr>
<tr>
<td>481.wrf</td>
<td>114</td>
<td>98.1</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>215</td>
<td>90.8</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 Hyper-Threading to Disable
Sysinfo program /spec17/config/sysinfo.reved
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runtime on localhost.localdomain Sat Jul 22 15:51:52 2017

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
Continued on next page
Huawei 2288H V5 (Intel Xeon Platinum 8156)  

SPECfp2006 = 123  
SPECfp_base2006 = 121  

CPU2006 license: 3175  
Test date: Jul-2017  
Test sponsor: Huawei  
Hardware Availability: Sep-2017  
Tested by: Huawei  
Software Availability: Nov-2016

Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Platinum 8156 CPU @ 3.60GHz
2 "physical id"s (chips)
8 "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 : 4
siblings : 4
physical 0: cores 5 8 10 11
physical 1: cores 0 3 10 13
cache size : 16896 KB

From /proc/meminfo
MemTotal: 790482140 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 21 18:22

SPEC is set to: /spec17
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 898G 19G 880G 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, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS INSYDE Corp. 0.20 07/14/2017
Memory:
24x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666 MHz
Continued on next page
Huawei
Huawei 2288H V5 (Intel Xeon Platinum 8156)

SPECfp2006 = 123
SPECfp_base2006 = 121

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

Test date: Jul-2017
Hardware Availability: Sep-2017
Software Availability: Nov-2016

Platform Notes (Continued)

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/spec17/libs/32:/spec17/libs/64:/spec17/sh10.2"
OMP_NUM_THREADS = "8"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
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

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

Continued on next page
Huawei

Huawei 2288H V5 (Intel Xeon Platinum 8156)

SPECfp2006 = 123
SPECfp_base2006 = 121

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

Test date: Jul-2017
Hardware Availability: Sep-2017
Software Availability: Nov-2016

Base Portability Flags (Continued)

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 -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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

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

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:

Continued on next page
Huawei

Huawei 2288H V5 (Intel Xeon Platinum 8156)

SPECfp2006 = 123
SPECfp_base2006 = 121

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

Test date: Jul-2017
Hardware Availability: Sep-2017
Software Availability: Nov-2016

Peak Optimization Flags (Continued)

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -fno-alias -auto-ilp32
447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-
434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -inline-level=0 -qopt-prefetch -parallel
465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -inline-call -qopt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: basepeak = yes

Continued on next page
SPEC CFP2006 Result

Huawei

Huawei 2288H V5 (Intel Xeon Platinum 8156)

SPECfp2006 = 123
SPECfp_base2006 = 121

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

Test date: Jul-2017
Hardware Availability: Sep-2017
Software Availability: Nov-2016

Peak Optimization Flags (Continued)

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-ic17.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-SKL-V1.6.xml

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 8 August 2017.