SPEC® CFP2006 Result

Huawei

Huawei 1288H V5 (Intel Xeon Silver 4108)

$SPECfp^{®}2006 =$ 108
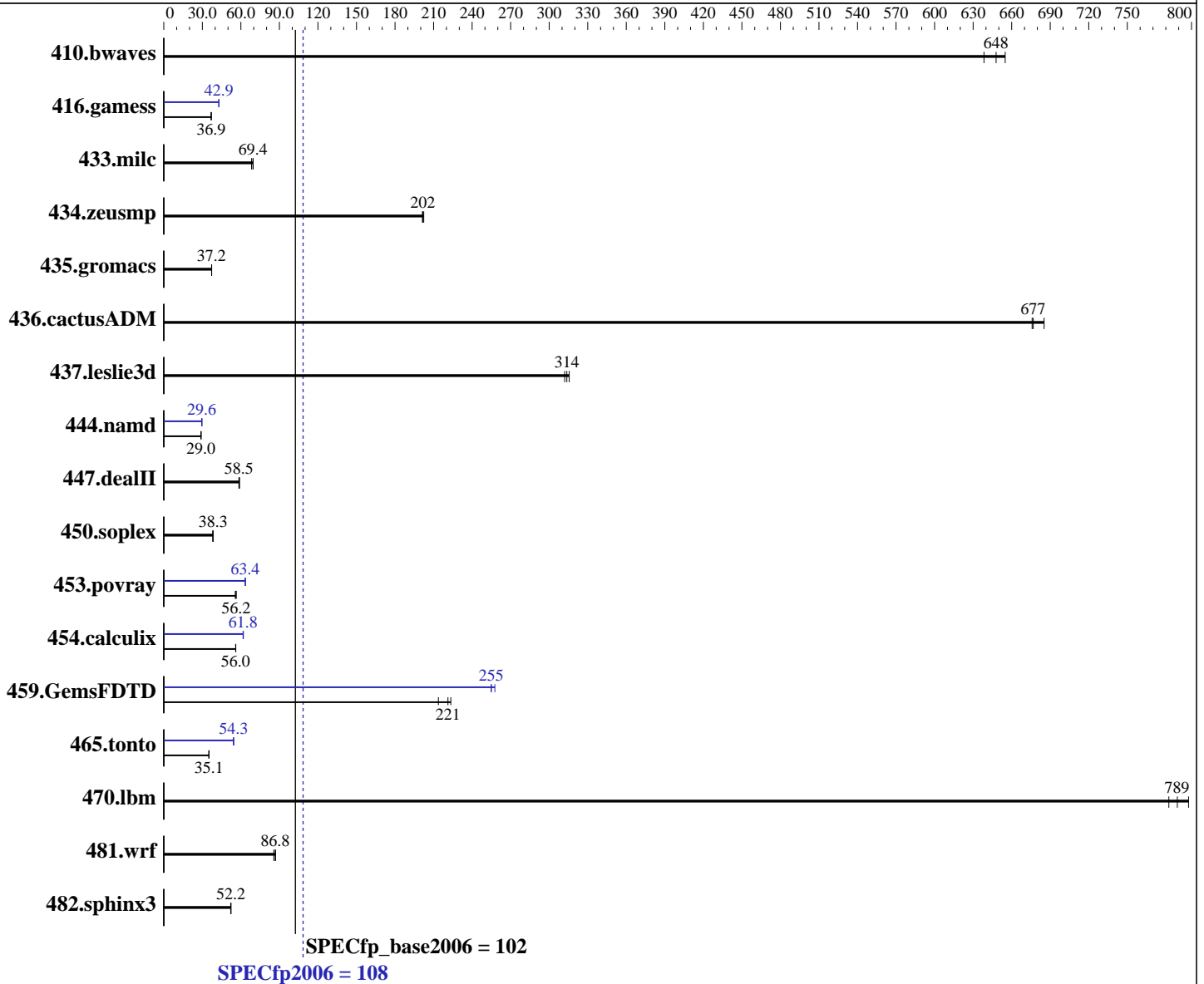
$SPECfp\_base2006 =$ 102

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

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

Benchmark	base	peak
410.bwaves	648	
416.gamess	36.9	42.9
433.milc	69.4	
434.zeusmp	202	
435.gromacs	37.2	
436.cactusADM	677	
437.leslie3d	314	
444.namd	29.0	29.6
447.dealII	58.5	
450.soplex	38.3	
453.povray	56.2	63.4
454.calculix	56.0	61.8
459.GemsFDTD	221	255
465.tonto	35.1	54.3
470.lbm	789	
481.wrf	86.8	
482.sphinx3	52.2	

SPECfp_base2006 = 102

SPECfp2006 = 108

Hardware

CPU Name: Intel Xeon Silver 4108
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 1800
FPU: Integrated
CPU(s) enabled: 16 cores, 2 chips, 8 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

Continued on next page

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

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L3 Cache:	11 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 1200 GB SAS, 10000 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	**21.0**	**648**	21.3	638	20.7	655	**21.0**	**648**	21.3	638	20.7	655
416.gamess	530	36.9	531	36.9	**530**	**36.9**	457	42.9	**457**	**42.9**	456	42.9
433.milc	132	69.5	**132**	**69.4**	134	68.3	132	69.5	**132**	**69.4**	134	68.3
434.zeusmp	45.0	202	45.2	201	**45.1**	**202**	45.0	202	45.2	201	**45.1**	**202**
435.gromacs	**192**	**37.2**	192	37.2	192	37.3	**192**	**37.2**	192	37.2	192	37.3
436.cactusADM	17.7	676	**17.7**	**677**	17.4	685	17.7	676	**17.7**	**677**	17.4	685
437.leslie3d	29.8	316	**30.0**	**314**	30.1	312	29.8	316	**30.0**	**314**	30.1	312
444.namd	277	29.0	277	29.0	**277**	**29.0**	271	29.6	**271**	**29.6**	271	29.6
447.dealII	194	59.0	196	58.5	**195**	**58.5**	194	59.0	196	58.5	**195**	**58.5**
450.soplex	**218**	**38.3**	219	38.1	218	38.3	**218**	**38.3**	219	38.1	218	38.3
453.povray	94.4	56.3	95.6	55.6	**94.6**	**56.2**	83.9	63.4	**83.9**	**63.4**	83.7	63.5
454.calculix	147	56.1	147	55.9	**147**	**56.0**	**134**	**61.8**	134	61.7	133	62.0
459.GemsFDTD	49.6	214	**48.0**	**221**	47.5	223	41.6	255	**41.6**	**255**	41.2	258
465.tonto	280	35.1	**280**	**35.1**	280	35.2	181	54.4	**181**	**54.3**	182	54.2
470.lbm	17.2	798	**17.4**	**789**	17.6	782	17.2	798	**17.4**	**789**	17.6	782
481.wrf	**129**	**86.8**	128	87.0	130	85.6	**129**	**86.8**	128	87.0	130	85.6
482.sphinx3	**373**	**52.2**	374	52.1	373	52.3	**373**	**52.2**	374	52.1	373	52.3

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.rev6993
    Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
    running on localhost.localdomain Wed Aug  2 16:33:04 2017

    This section contains SUT (System Under Test) info as seen by
    some common utilities.  To remove or add to this section, see:
```

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Platform Notes (Continued)

```
   http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
      2 "physical id"s (chips)
      16 "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 : 8
      siblings  : 8
      physical 0: cores 0 1 2 3 4 5 6 7
      physical 1: cores 0 1 2 3 4 5 6 7
   cache size : 11264 KB

From /proc/meminfo
   MemTotal:       394145204 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      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)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

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 Aug 1 13:31

SPEC is set to: /spec17
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      xfs   898G   18G  881G   2% /
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:
```

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Platform Notes (Continued)

```
    24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz, configured at 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"
LD_LIBRARY_PATH = "/spec17/libs/32:/spec17/libs/64:/spec17/sh10.2"
OMP_NUM_THREADS = "16"

 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
```

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Base Portability Flags (Continued)

```
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 -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:

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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-calloc -qopt-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`

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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

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

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