SPEC® CFP2006 Result
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Huawei

Huawei 1288H V5 (Intel Xeon Platinum 8180)

$SPECfp^{®}2006 =$ 163
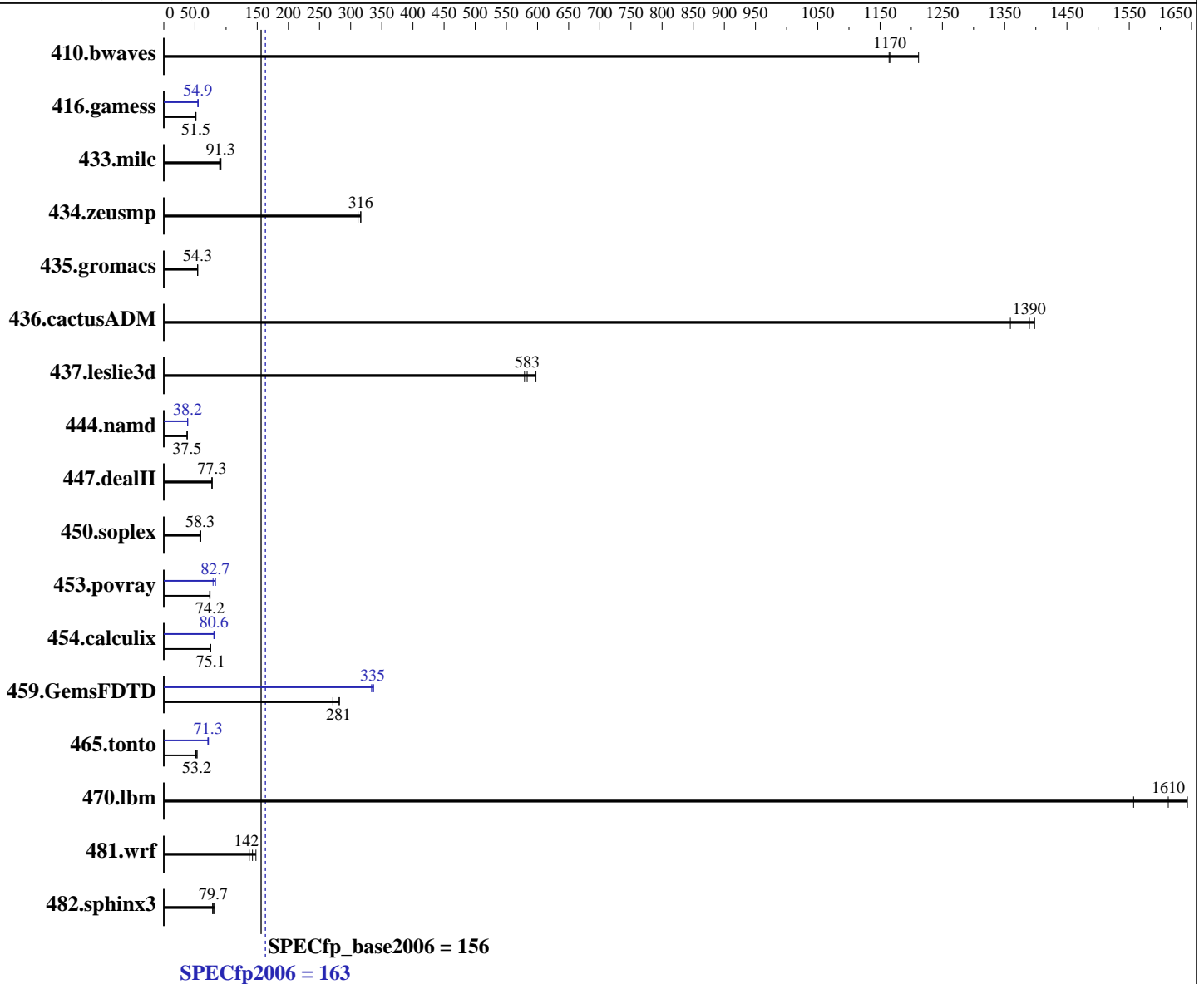
$SPECfp\_base2006 =$ 156

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

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

SPECfp_base2006 = 156
SPECfp2006 = 163

Benchmark	Base	Peak
410.bwaves	1170	
416.gamess	51.5	54.9
433.milc	91.3	
434.zeusmp	316	
435.gromacs	54.3	
436.cactusADM	1390	
437.leslie3d	583	
444.namd	37.5	38.2
447.dealII	77.3	
450.soplex	58.3	
453.povray	74.2	82.7
454.calculix	75.1	80.6
459.GemsFDTD	281	335
465.tonto	53.2	71.3
470.lbm	1610	
481.wrf	142	
482.sphinx3	79.7	

Hardware

CPU Name: Intel Xeon Platinum 8180
CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz: 2500
FPU: Integrated
CPU(s) enabled: 56 cores, 2 chips, 28 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: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default
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
System State: Run level 3 (multi-user)

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L3 Cache:	38.5 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)	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	**11.7**	**1170**	11.2	1210	11.7	1160	**11.7**	**1170**	11.2	1210	11.7	1160
416.gamess	**380**	**51.5**	380	51.5	380	51.5	357	54.9	**357**	**54.9**	356	55.0
433.milc	**101**	**91.3**	102	89.7	100	91.8	**101**	**91.3**	102	89.7	100	91.8
434.zeusmp	**28.8**	**316**	28.8	316	29.2	312	**28.8**	**316**	28.8	316	29.2	312
435.gromacs	132	54.2	**132**	**54.3**	131	54.3	132	54.2	**132**	**54.3**	131	54.3
436.cactusADM	8.79	1360	8.55	1400	**8.60**	**1390**	8.79	1360	8.55	1400	**8.60**	**1390**
437.leslie3d	**16.1**	**583**	15.7	597	16.2	579	**16.1**	**583**	15.7	597	16.2	579
444.namd	**214**	**37.5**	214	37.5	214	37.4	210	38.2	**210**	**38.2**	210	38.3
447.dealII	**148**	**77.3**	147	77.6	148	77.3	**148**	**77.3**	147	77.6	148	77.3
450.soplex	144	58.0	140	59.4	**143**	**58.3**	144	58.0	140	59.4	**143**	**58.3**
453.povray	72.3	73.6	**71.7**	**74.2**	71.7	74.2	**64.3**	**82.7**	64.3	82.7	67.3	79.1
454.calculix	**110**	**75.1**	110	75.1	110	74.9	**102**	**80.6**	102	80.6	102	80.6
459.GemsFDTD	**37.8**	**281**	37.6	282	39.1	271	**31.7**	**335**	31.5	337	31.8	334
465.tonto	192	51.4	**185**	**53.2**	184	53.4	**138**	**71.3**	137	71.7	139	70.7
470.lbm	8.36	1640	**8.52**	**1610**	8.82	1560	8.36	1640	**8.52**	**1610**	8.82	1560
481.wrf	75.5	148	**78.5**	**142**	81.4	137	75.5	148	**78.5**	**142**	81.4	137
482.sphinx3	240	81.1	**245**	**79.7**	249	78.3	240	81.1	**245**	**79.7**	249	78.3

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 linux-jm4z Fri May 26 21:56:27 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

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Platform Notes (Continued)

```
From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz
      2 "physical id"s (chips)
      56 "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 : 28
      siblings  : 28
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
   cache size : 39424 KB

From /proc/meminfo
   MemTotal:       394122080 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 2
      # This file is deprecated and will be removed in a future service pack or
      release.
      # Please check /etc/os-release for details about this release.
   os-release:
      NAME="SLES"
      VERSION="12-SP2"
      VERSION_ID="12.2"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
   Linux linux-jm4z 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
   (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 26 09:01

SPEC is set to: /spec17
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       xfs   828G   24G  805G   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
```

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Platform Notes (Continued)

```
    hardware, firmware, and the "DMTF SMBIOS" standard.

    BIOS INSYDE Corp. 0.10 03/09/2017
    Memory:
    24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 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 = "56"

 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
```

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Base Portability Flags (Continued)

```
       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 -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
```

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Hardware Availability: Jul-2017
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Peak Optimization Flags

C benchmarks:

      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`

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Peak Optimization Flags (Continued)

454.calculix: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32`

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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