SPEC® CFP2006 Result
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Huawei

Huawei RH2288H V3 (Intel Xeon E5-2698 v3)

$SPECfp®_rate2006 = $ 896

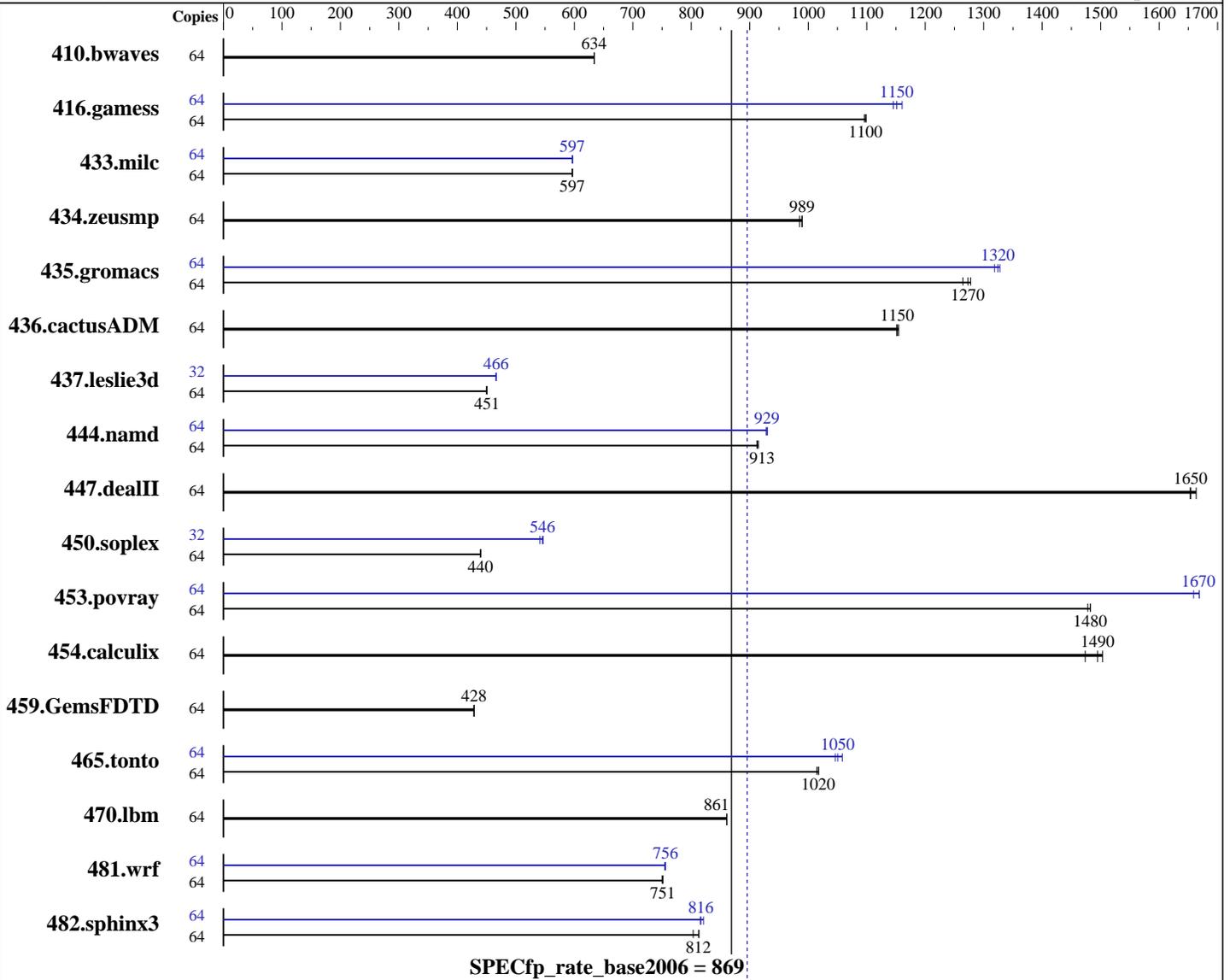$SPECfp_rate_base2006 = $ 869

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

Test date: Feb-2015
Hardware Availability: Sep-2014
Software Availability: Sep-2013

Copies		
410.bwaves	64	634
416.gamess	64	1150
	64	1100
433.milc	64	597
	64	597
434.zeusmp	64	989
435.gromacs	64	1320
	64	1270
436.cactusADM	64	1150
437.leslie3d	32	466
	64	451
444.namd	64	929
	64	913
447.dealII	64	1650
450.soplex	32	546
	64	440
453.povray	64	1670
	64	1480
454.calculix	64	1490
459.GemsFDTD	64	428
465.tonto	64	1050
	64	1020
470.lbm	64	861
481.wrf	64	756
	64	751
482.sphinx3	64	816
	64	812

SPECfp_rate_base2006 = 869

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Hardware

CPU Name:	Intel Xeon E5-2698 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	32 cores, 2 chips, 16 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.5 (Santiago) 2.6.32-431.el6.x86_64
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	ext4

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L3 Cache: 40 MB I+D on chip per chip	System State: Run level 3 (multi-user)
Other Cache: None	Base Pointers: 32/64-bit
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Peak Pointers: 32/64-bit
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM	Other Software: None
Other Hardware: None	

Results Table

Benchmark		Base							Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	**1372**	**634**	1372	634	1372	634	64	**1372**	**634**	1372	634	1372	634
416.gamess	64	1140	1100	1144	1100	**1141**	**1100**	64	1080	1160	1094	1150	**1088**	**1150**
433.milc	64	**985**	**597**	985	597	985	596	64	985	597	**985**	**597**	984	597
434.zeusmp	64	**589**	**989**	589	989	591	985	64	**589**	**989**	589	989	591	985
435.gromacs	64	**359**	**1270**	361	1260	358	1280	64	**345**	**1320**	347	1320	344	1330
436.cactusADM	64	**664**	**1150**	662	1150	664	1150	64	**664**	**1150**	662	1150	664	1150
437.leslie3d	64	1338	450	1335	451	**1335**	**451**	32	645	466	644	467	**645**	**466**
444.namd	64	563	912	561	915	**562**	**913**	64	**552**	**929**	553	928	552	930
447.dealII	64	440	1660	**443**	**1650**	443	1650	64	440	1660	**443**	**1650**	443	1650
450.soplex	64	**1214**	**440**	1214	440	1215	439	32	488	547	493	541	**489**	**546**
453.povray	64	230	1480	230	1480	**230**	**1480**	64	205	1660	204	1670	**204**	**1670**
454.calculix	64	**353**	**1490**	351	1500	358	1470	64	**353**	**1490**	351	1500	358	1470
459.GemsFDTD	64	1585	428	**1585**	**428**	1584	429	64	1585	428	**1585**	**428**	1584	429
465.tonto	64	**619**	**1020**	619	1020	621	1010	64	595	1060	602	1050	**600**	**1050**
470.lbm	64	1022	861	1021	861	**1022**	**861**	64	1022	861	1021	861	**1022**	**861**
481.wrf	64	**952**	**751**	951	752	953	750	64	**946**	**756**	947	755	946	756
482.sphinx3	64	**1536**	**812**	1553	803	1534	813	64	1520	821	1530	815	**1528**	**816**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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"

Platform Notes

BIOS configuration:
Set Power Efficiency Mode to Custom
Set Snoop Mode to COD

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Platform Notes (Continued)

```
Set Patrol Scrub to Disable
Baseboard Management Controller used to adjust the fan speed to 100%
Sysinfo program /spec/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Fri Feb 27 22:04:49 2015

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 E5-2698 v3 @ 2.30GHz
      2 "physical id"s (chips)
      64 "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 : 16
      siblings  : 32
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       264270708 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux localhost.localdomain 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54
   EST 2013 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 25 21:46

SPEC is set to: /spec
   Filesystem      Type   Size   Used Avail Use% Mounted on
   /dev/sda1       ext4   268G   163G   91G  65% /

Additional information from dmidecode:
   BIOS Insyde Corp. 1.13 08/12/2014
   Memory:
    8x NO DIMM NO DIMM     3 rank
    8x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 1 rank
    8x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank
```
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Platform Notes (Continued)

```
(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/spec/libs/32:/spec/libs/64:/spec/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_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>
```

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
```

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$SPECfp_rate2006 = $ **896**

$SPECfp_rate_base2006 = $ **869**

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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

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 (except as noted below):
```
icc    -m64
```
```
482.sphinx3: icc -m32
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```
```
450.soplex: icpc -m32
```

Fortran benchmarks:
```
ifort -m64
```

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

Peak Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
```

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Huawei

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Tested by: Huawei

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Peak Portability Flags (Continued)

```
     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
      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
```

Peak Optimization Flags

C benchmarks:

```
       433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                 -O3(pass 2) -no-prec-div(pass 2)
                 -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                 -auto-ilp32

        470.lbm: basepeak = yes

    482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
                 -unroll2
```

C++ benchmarks:

```
       444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                 -O3(pass 2) -no-prec-div(pass 2)
                 -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
                 -auto-ilp32

      447.dealII: basepeak = yes

     450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                 -O3(pass 2) -no-prec-div(pass 2)
                 -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                 -opt-malloc-options=3

     453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                 -O3(pass 2) -no-prec-div(pass 2)
                 -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
                 -ansi-alias
```

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Peak Optimization Flags (Continued)

Fortran benchmarks:

>   410.bwaves: basepeak = yes

>   416.gamess: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
>   -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
>   -inline-level=0 -scalar-rep-

>   434.zeusmp: basepeak = yes

>   437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

> 459.GemsFDTD: basepeak = yes

>   465.tonto: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
>   -O3(pass 2) -no-prec-div(pass 2) -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(pass 1) -ipo(pass 2)
>   -O3(pass 2) -no-prec-div(pass 2)
>   -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
>   -opt-prefetch -auto-ilp32

> 436.cactusADM: basepeak = yes

>   454.calculix: basepeak = yes

>   481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-HASWELL-V1.4.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-HASWELL-V1.4.xml

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