SPEC® CFP2006 Result
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Huawei

Huawei RH2288H V3 (Intel Xeon E5-2683 v4)

$SPECfp^{®}\_rate2006 = 958$

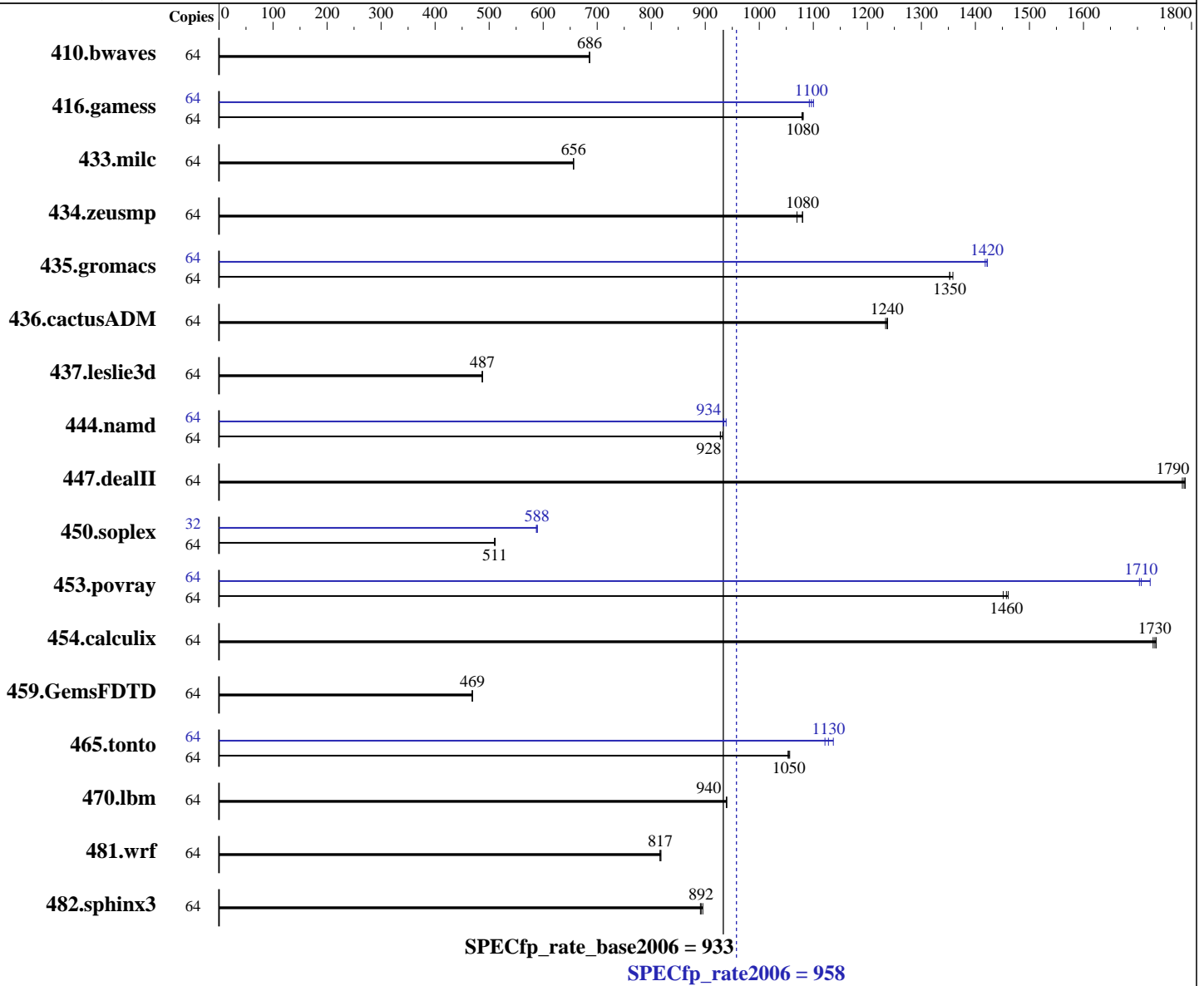$SPECfp\_rate\_base2006 = 933$

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

Test date: Nov-2016
Hardware Availability: Mar-2016
Software Availability: Nov-2015

Benchmark	Copies	Result
410.bwaves	64	686
416.gamess	64	1100
416.gamess	64	1080
433.milc	64	656
434.zeusmp	64	1080
435.gromacs	64	1420
435.gromacs	64	1350
436.cactusADM	64	1240
437.leslie3d	64	487
444.namd	64	934
444.namd	64	928
447.dealII	64	1790
450.soplex	32	588
450.soplex	64	511
453.povray	64	1710
453.povray	64	1460
454.calculix	64	1730
459.GemsFDTD	64	469
465.tonto	64	1130
465.tonto	64	1050
470.lbm	64	940
481.wrf	64	817
482.sphinx3	64	892

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Hardware

CPU Name: Intel Xeon E5-2683 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2100
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 7.2 (Maipo)
3.10.0-327.el7.x86_64
Compiler: 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
Auto Parallel: No
File System: xfs
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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:	512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 1000 GB SATA, 7200 RPM	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	64	**1268**	**686**	1268	686	1269	686	64	**1268**	**686**	1268	686	1269	686
416.gamess	64	**1160**	**1080**	1161	1080	1159	1080	64	1147	1090	1139	1100	**1143**	**1100**
433.milc	64	896	656	**895**	**656**	895	656	64	896	656	**895**	**656**	895	656
434.zeusmp	64	544	1070	539	1080	**539**	**1080**	64	544	1070	539	1080	**539**	**1080**
435.gromacs	64	**338**	**1350**	338	1350	336	1360	64	322	1420	321	1420	**321**	**1420**
436.cactusADM	64	**619**	**1240**	618	1240	620	1230	64	**619**	**1240**	618	1240	620	1230
437.leslie3d	64	**1235**	**487**	1233	488	1235	487	64	**1235**	**487**	1233	488	1235	487
444.namd	64	551	932	**553**	**928**	553	928	64	547	939	550	934	**549**	**934**
447.dealII	64	409	1790	**410**	**1790**	411	1780	64	409	1790	**410**	**1790**	411	1780
450.soplex	64	**1045**	**511**	1044	511	1047	510	32	454	587	**454**	**588**	453	589
453.povray	64	235	1450	**234**	**1460**	233	1460	64	200	1700	**199**	**1710**	198	1720
454.calculix	64	**305**	**1730**	304	1730	305	1730	64	**305**	**1730**	304	1730	305	1730
459.GemsFDTD	64	1447	469	**1448**	**469**	1449	469	64	1447	469	**1448**	**469**	1449	469
465.tonto	64	**597**	**1050**	596	1060	598	1050	64	554	1140	562	1120	**558**	**1130**
470.lbm	64	**936**	**940**	937	939	936	940	64	**936**	**940**	937	939	936	940
481.wrf	64	876	816	874	818	**875**	**817**	64	876	816	874	818	**875**	**817**
482.sphinx3	64	1393	895	1400	891	**1398**	**892**	64	1393	895	1400	891	**1398**	**892**

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 Performance
Set Snoop Mode to COD mode

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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 /spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Wed Nov  2 20:49:26 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 E5-2683 v4 @ 2.10GHz
      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:       527788144 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.2 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.2"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

uname -a:
   Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
   EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 2 08:35

SPEC is set to: /spec16
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   911G  153G  758G  17% /
Additional information from dmidecode:
```

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Platform Notes (Continued)

```
    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. 3.32 09/14/2016
  Memory:
    8x NO DIMM NO DIMM
    16x Samsung M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz

 (End of data from sysinfo program)
```

General Notes

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

 Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
 memory using RedHat EL 7.1
 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>
```

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
```

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Base Portability Flags (Continued)

```
    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
     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:
```
    icc   -m64
```

C++ benchmarks (except as noted below):
```
    icpc   -m64
```

```
    450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

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

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Peak Compiler Invocation (Continued)

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

Peak 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: `-D_FILE_OFFSET_BITS=64`
        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`

Peak Optimization Flags

C benchmarks:

        433.milc: basepeak = yes

        470.lbm: basepeak = yes

        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: `-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-malloc-options=3`

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Peak Optimization Flags (Continued)

　　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) -unroll4 -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

　459.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

　436.cactusADM: basepeak = yes

　　454.calculix: basepeak = yes

　　　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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-BDW-V1.0.html

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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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