SPEC® CFP2006 Result
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Huawei

Huawei RH8100 V3 (Intel Xeon E7-8880 v4)

$SPECfp®\_rate2006 = 4460$

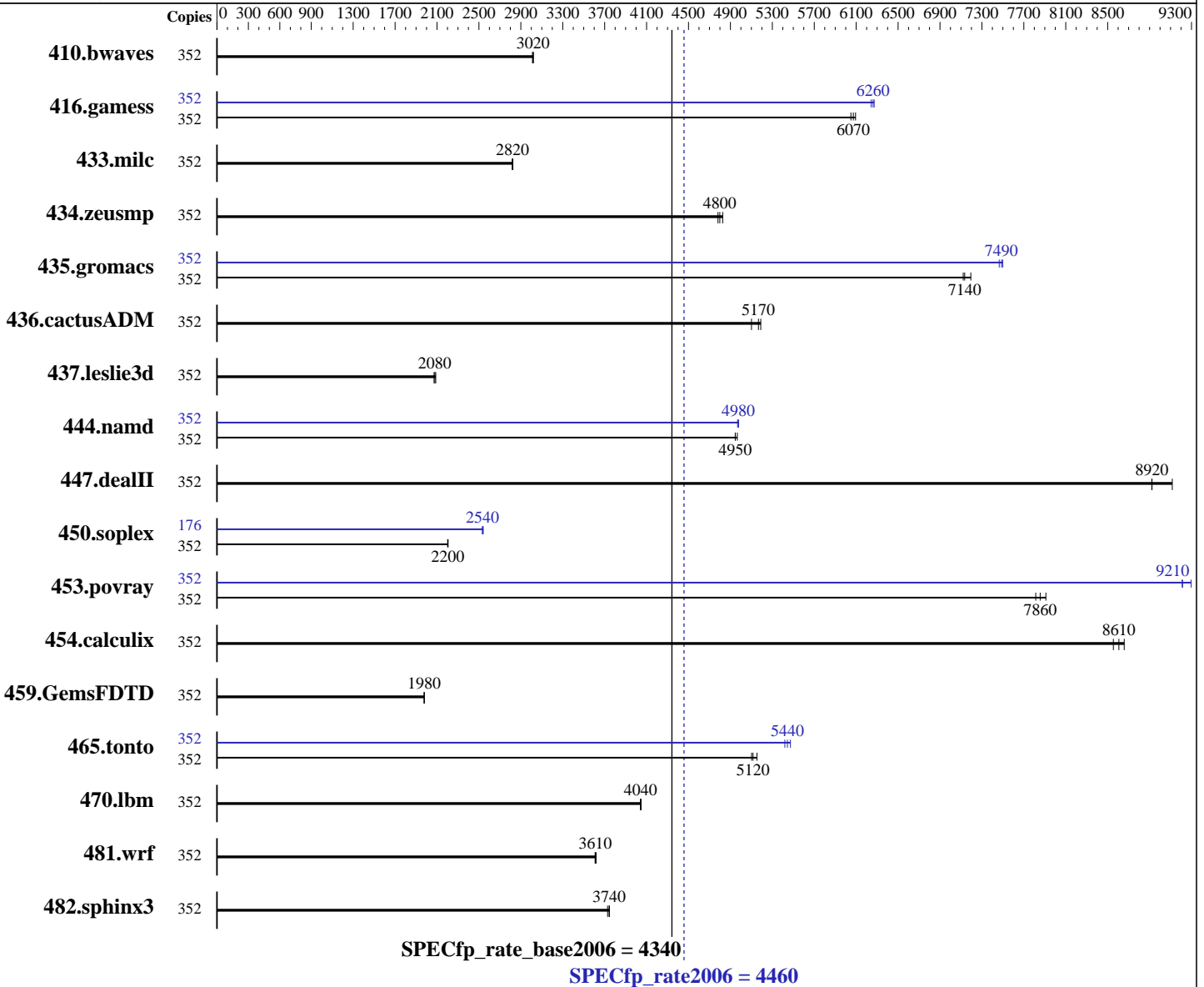$SPECfp\_rate\_base2006 = 4340$

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

Test date: Oct-2016
Hardware Availability: Jun-2016
Software Availability: Nov-2015

Benchmark	Copies	Result
410.bwaves	352	3020
416.gamess	352	6260
416.gamess	352	6070
433.milc	352	2820
434.zeusmp	352	4800
435.gromacs	352	7490
435.gromacs	352	7140
436.cactusADM	352	5170
437.leslie3d	352	2080
444.namd	352	4980
444.namd	352	4950
447.dealII	352	8920
450.soplex	176	2540
450.soplex	352	2200
453.povray	352	9210
453.povray	352	7860
454.calculix	352	8610
459.GemsFDTD	352	1980
465.tonto	352	5440
465.tonto	352	5120
470.lbm	352	4040
481.wrf	352	3610
482.sphinx3	352	3740

$SPECfp\_rate\_base2006 = 4340$
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Hardware

CPU Name: Intel Xeon E7-8880 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 176 cores, 8 chips, 22 cores/chip, 2 threads/core
CPU(s) orderable: 2,4,6,8 chips
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:	55 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	1 TB (64 x 16 GB 2Rx8 PC4-2400T-R, running at 1600 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	2 x 600 GB SAS, 10K RPM		
Other Hardware:	None		

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	352	1589	3010	**1586**	**3020**	1584	3020	352	1589	3010	**1586**	**3020**	1584	3020
416.gamess	352	**1135**	**6070**	1139	6050	1131	6090	352	1104	6240	1099	6270	**1101**	**6260**
433.milc	352	**1145**	**2820**	1144	2820	1147	2820	352	**1145**	**2820**	1144	2820	1147	2820
434.zeusmp	352	664	4830	670	4780	**668**	**4800**	352	664	4830	670	4780	**668**	**4800**
435.gromacs	352	**352**	**7140**	349	7190	353	7120	352	335	7500	337	7470	**336**	**7490**
436.cactusADM	352	825	5100	811	5190	**814**	**5170**	352	825	5100	811	5190	**814**	**5170**
437.leslie3d	352	1597	2070	**1591**	**2080**	1585	2090	352	1597	2070	**1591**	**2080**	1585	2090
444.namd	352	569	4970	**571**	**4950**	571	4950	352	**567**	**4980**	567	4980	568	4970
447.dealII	352	**451**	**8920**	442	9120	451	8920	352	**451**	**8920**	442	9120	451	8920
450.soplex	352	1334	2200	1331	2210	**1332**	**2200**	176	**579**	**2540**	578	2540	580	2530
453.povray	352	237	7910	**238**	**7860**	240	7810	352	**203**	**9210**	201	9300	203	9210
454.calculix	352	339	8550	335	8660	**337**	**8610**	352	339	8550	335	8660	**337**	**8610**
459.GemsFDTD	352	**1888**	**1980**	1889	1980	1888	1980	352	**1888**	**1980**	1889	1980	1888	1980
465.tonto	352	**677**	**5120**	679	5100	672	5150	352	639	5420	633	5470	**636**	**5440**
470.lbm	352	1197	4040	**1196**	**4040**	1195	4050	352	1197	4040	**1196**	**4040**	1195	4050
481.wrf	352	1087	3620	**1089**	**3610**	1090	3610	352	1087	3620	**1089**	**3610**	1090	3610
482.sphinx3	352	1840	3730	**1833**	**3740**	1832	3750	352	1840	3730	**1833**	**3740**	1832	3750

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"
Turbo mode set with:
cpupower -c all frequency-set -g performance

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Platform Notes

```
     BIOS configuration:
     Set Power Efficiency Mode to Performance
     Set Lock_step to disabled
     Baseboard Management Controller used to adjust the fan speed to 100%
     Set C-State to C0/C1
     Sysinfo program /home/spec/config/sysinfo.rev6914
     $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
     running on RH8100V3 Tue Oct 18 08:51:45 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 E7-8880 v4 @ 2.20GHz
           8 "physical id"s (chips)
           352 "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 : 22
           siblings  : 44
           physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 4: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 5: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 6: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
           physical 7: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
           28
        cache size : 56320 KB

     From /proc/meminfo
        MemTotal:       1056479044 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"
```

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Platform Notes (Continued)

```
      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 RH8100V3 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 Oct 17 10:19

 SPEC is set to: /home/spec
   Filesystem              Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   466G  8.0G  458G   2% /home
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 American Megatrends Inc. 5.11 02/05/2016
  Memory:
  128x NO DIMM NO DIMM
  64x Samsung M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz, configured at 1600 MHz

 (End of data from sysinfo program)
```

General Notes

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

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Base Compiler Invocation (Continued)

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
         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

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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

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:

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Peak Optimization Flags (Continued)

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

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

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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-V1.2-BDW-RevG.html

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-V1.2-BDW-RevG.xml

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

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