SPEC® CFP2006 Result

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Huawei

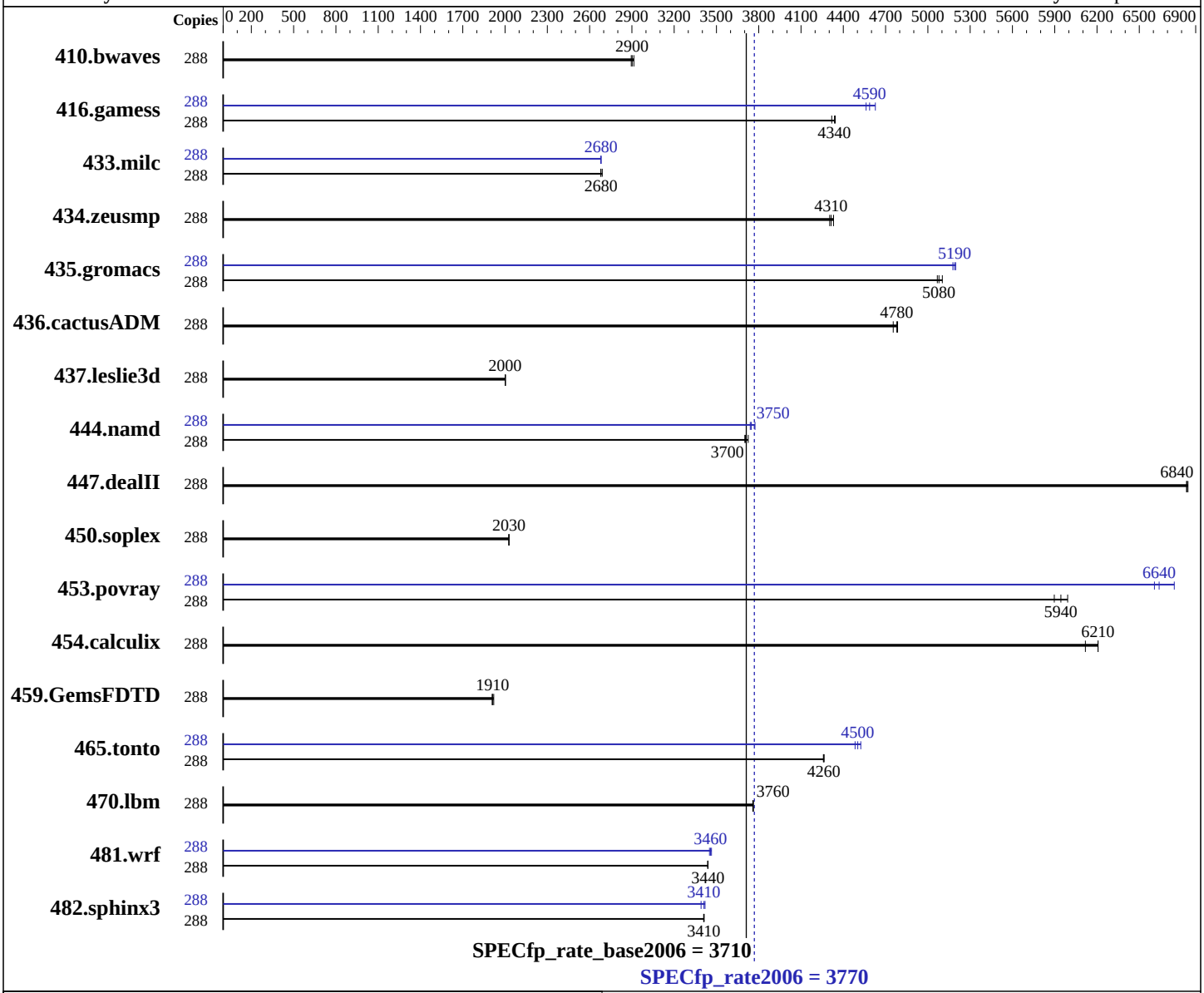
Huawei RH8100 V3 (Intel Xeon E7-8870 v3)

SPECfp®_rate2006 = 3770

SPECfp_rate_base2006 = 3710

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

Test date: May-2015
Hardware Availability: May-2015
Software Availability: Sep-2014



Hardware

CPU Name:	Intel Xeon E7-8870 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	144 cores, 8 chips, 18 cores/chip, 2 threads/core
CPU(s) orderable:	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

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Software

Operating System:	Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64
Compiler:	C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux; Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	ext4

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L3 Cache: 45 MB I+D on chip per chip
Other Cache: None
Memory: 2 TB (128 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 3 x 300 GB SAS, 10K RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	288	1343	2910	1352	2900	**1349**	**2900**	288	1343	2910	1352	2900	**1349**	**2900**
416.gamess	288	1298	4340	**1300**	**4340**	1306	4320	288	1219	4630	**1229**	**4590**	1236	4560
433.milc	288	**986**	**2680**	987	2680	983	2690	288	986	2680	987	2680	**986**	**2680**
434.zeusmp	288	609	4300	**608**	**4310**	605	4330	288	609	4300	**608**	**4310**	605	4330
435.gromacs	288	403	5100	**405**	**5080**	406	5070	288	396	5200	**396**	**5190**	397	5180
436.cactusADM	288	724	4750	719	4790	**720**	**4780**	288	724	4750	719	4790	**720**	**4780**
437.leslie3d	288	**1353**	**2000**	1351	2000	1353	2000	288	**1353**	**2000**	1351	2000	1353	2000
444.namd	288	620	3730	624	3700	**623**	**3700**	288	612	3770	618	3740	**616**	**3750**
447.dealII	288	482	6840	481	6850	**482**	**6840**	288	482	6840	481	6850	**482**	**6840**
450.soplex	288	**1185**	**2030**	1184	2030	1185	2030	288	**1185**	**2030**	1184	2030	1185	2030
453.povray	288	**258**	**5940**	260	5900	256	5990	288	232	6610	**231**	**6640**	227	6750
454.calculix	288	383	6210	**383**	**6210**	388	6120	288	383	6210	**383**	**6210**	388	6120
459.GemsFDTD	288	1601	1910	1592	1920	**1599**	**1910**	288	1601	1910	1592	1920	**1599**	**1910**
465.tonto	288	665	4260	**665**	**4260**	665	4260	288	**629**	**4500**	632	4480	626	4520
470.lbm	288	**1053**	**3760**	1053	3760	1052	3760	288	**1053**	**3760**	1053	3760	1052	3760
481.wrf	288	**935**	**3440**	935	3440	936	3440	288	**930**	**3460**	928	3460	932	3450
482.sphinx3	288	**1646**	**3410**	1645	3410	1647	3410	288	1655	3390	1642	3420	**1645**	**3410**

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
```

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 DRAM Maintenace to Manual
Set DRAM Maintenace Mode to pTRR
Set Patrol Scrub to Enabled
Set Memory Power Saving to disabled
Sysinfo program /spec/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on RH8100V3 Sun May 24 15:31:23 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 E7-8870 v3 @ 2.10GHz
      8 "physical id"s (chips)
      288 "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 : 18
      siblings  : 36
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 4: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 5: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 6: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 7: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 46080 KB

From /proc/meminfo
   MemTotal:       2113342788 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.0 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.0"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
```

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Platform Notes (Continued)

```
      system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

   uname -a:
      Linux RH8100V3 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014
      x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 May 23 14:16

   SPEC is set to: /spec
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda2      ext4  452G  5.0G  424G   2% /spec
   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. BLISV705 03/30/2015
     Memory:
      64x NO DIMM NO DIMM
      128x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz

   (End of data from sysinfo program)
   Regarding the sysinfo display about the memory installed, the correct amount of
   memory is 2 TB and the dmidecode description should have two lines reading as:
      64x NO DIMM NO DIMM
      128x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz
```

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 i5-4670K CPU + 16GB
  memory using RedHat EL 7.0
  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
```

Continued on next page

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

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:

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: basepeak = yes

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

Continued on next page

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: basepeak = yes

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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.0-HSW-RevG.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Huawei-Platform-Settings-V1.0-HSW-RevG.xml

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