SPEC® CFP2006 Result
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Huawei

Huawei BH640 V2 (Intel Xeon E5-4640 v2)

$SPECfp®\_rate2006 = \quad 699$

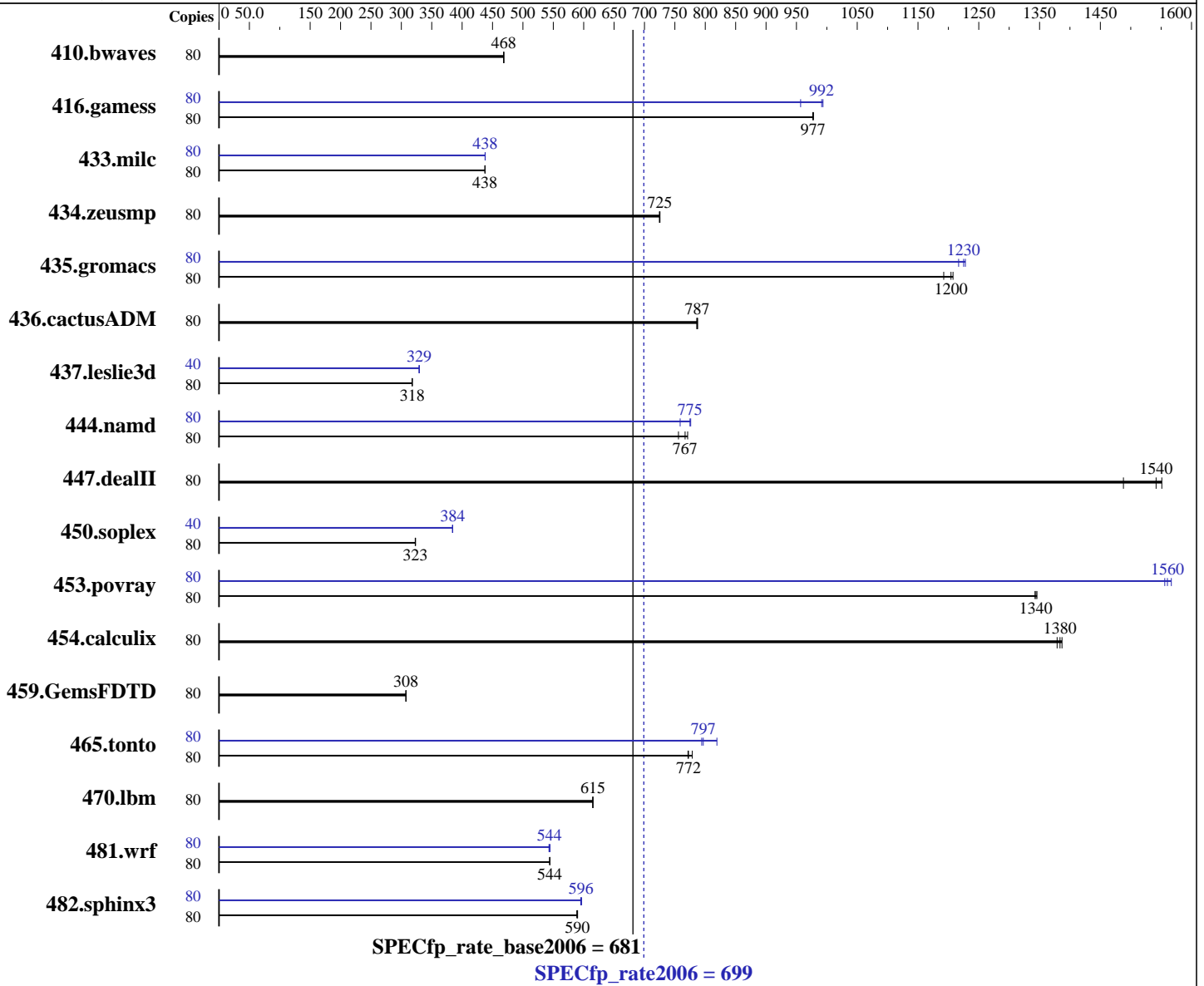$SPECfp\_rate\_base2006 = \quad 681$

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

Test date: Sep-2014
Hardware Availability: Mar-2014
Software Availability: Nov-2013

Copies	Result
410.bwaves	80 — 468
416.gamess	80 — 992 / 80 — 977
433.milc	80 — 438 / 80 — 438
434.zeusmp	80 — 725
435.gromacs	80 — 1230 / 80 — 1200
436.cactusADM	80 — 787
437.leslie3d	40 — 329 / 80 — 318
444.namd	80 — 775 / 80 — 767
447.dealII	80 — 1540
450.soplex	40 — 384 / 80 — 323
453.povray	80 — 1560 / 80 — 1340
454.calculix	80 — 1380
459.GemsFDTD	80 — 308
465.tonto	80 — 797 / 80 — 772
470.lbm	80 — 615
481.wrf	80 — 544 / 80 — 544
482.sphinx3	80 — 596 / 80 — 590

SPECfp_rate_base2006 = 681

SPECfp_rate2006 = 699

Hardware

CPU Name: Intel Xeon E5-4640 v2
CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 2,4 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

Continued on next page

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L3 Cache: 20 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 PC3-12800R-11, ECC)	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	80	2321	468	**2321**	**468**	2320	469	80	2321	468	**2321**	**468**	2320	469
416.gamess	80	1604	977	**1602**	**977**	1602	978	80	**1580**	**992**	1637	957	1576	994
433.milc	80	1677	438	**1678**	**438**	1679	438	80	1677	438	1677	438	**1677**	**438**
434.zeusmp	80	1005	725	**1004**	**725**	1003	725	80	1005	725	**1004**	**725**	1003	725
435.gromacs	80	**474**	**1200**	479	1190	473	1210	80	469	1220	465	1230	**466**	**1230**
436.cactusADM	80	**1215**	**787**	1214	788	1216	786	80	**1215**	**787**	1214	788	1216	786
437.leslie3d	80	2366	318	**2366**	**318**	2364	318	40	**1141**	**329**	1142	329	1141	329
444.namd	80	**837**	**767**	849	756	832	771	80	**828**	**775**	846	759	827	776
447.dealII	80	615	1490	590	1550	**594**	**1540**	80	615	1490	590	1550	**594**	**1540**
450.soplex	80	2063	323	2067	323	**2065**	**323**	40	868	384	868	384	**868**	**384**
453.povray	80	316	1350	**317**	**1340**	317	1340	80	**273**	**1560**	272	1570	274	1560
454.calculix	80	**477**	**1380**	479	1380	476	1390	80	**477**	**1380**	479	1380	476	1390
459.GemsFDTD	80	2760	307	**2759**	**308**	2759	308	80	2760	307	**2759**	**308**	2759	308
465.tonto	80	1011	779	**1019**	**772**	1020	772	80	961	819	991	794	**988**	**797**
470.lbm	80	1787	615	1788	615	**1787**	**615**	80	1787	615	1788	615	**1787**	**615**
481.wrf	80	**1642**	**544**	1641	545	1643	544	80	1641	545	**1643**	**544**	1646	543
482.sphinx3	80	2649	589	**2643**	**590**	2643	590	80	2613	597	**2617**	**596**	2620	595

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

Sysinfo program /spec14/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Wed Sep 10 17:27:08 2014

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Platform Notes (Continued)

```
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 E5-4640 v2 @ 2.20GHz
      4 "physical id"s (chips)
      80 "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 : 10
      siblings  : 20
      physical 0: cores 0 1 2 3 4 8 9 10 11 12
      physical 1: cores 0 1 2 3 4 8 9 10 11 12
      physical 2: cores 0 1 2 3 4 8 9 10 11 12
      physical 3: cores 0 1 2 3 4 8 9 10 11 12
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       264477564 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 Sep 9 14:30

SPEC is set to: /spec14
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext4  411G   82G  308G  22% /

Additional information from dmidecode:
  BIOS Insyde Corp. RMIBV386 06/30/2014
  Memory:
   4x Hynix HMT42GR7AFR4C-PB 16 GB 1600 MHz 2 rank
   12x Hynix HMT42GR7MFR4C-PB 16 GB 1600 MHz 2 rank
   8x NO DIMM NO DIMM

(End of data from sysinfo program)
```

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SPECfp_rate2006 =   699

SPECfp_rate_base2006 =   681

CPU2006 license: 3175		**Test date:**	Sep-2014
Test sponsor: Huawei		**Hardware Availability:**	Mar-2014
Tested by: Huawei		**Software Availability:**	Nov-2013

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/spec14/libs/32:/spec14/libs/64:/spec14/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
      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
```

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CPU2006 license: 3175	**Test date:** Sep-2014
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Base Optimization Flags

C benchmarks:

```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:

```
-xAVX -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
    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
```

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Tested by: Huawei

Test date: Sep-2014
Hardware Availability: Mar-2014
Software Availability: Nov-2013

Peak Portability Flags (Continued)

```
   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: -xAVX(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: -xAVX -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
              -unroll2
```

C++ benchmarks:

```
   444.namd: -xAVX(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: -xAVX(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: -xAVX(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
```

Fortran benchmarks:

```
  410.bwaves: basepeak = yes
```

```
  416.gamess: -xAVX(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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch
```

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Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(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: -xAVX(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: -xAVX -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-V1.0-IVB-RevG.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-V1.0-IVB-RevG.xml

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

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