



SPEC[®] CFP2006 Result

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Huawei

SPECfp[®]_rate2006 = 1190

Huawei RH2485 v2 (Intel Xeon E5-4650 v2)

SPECfp_rate_base2006 = 1160

CPU2006 license: 3175

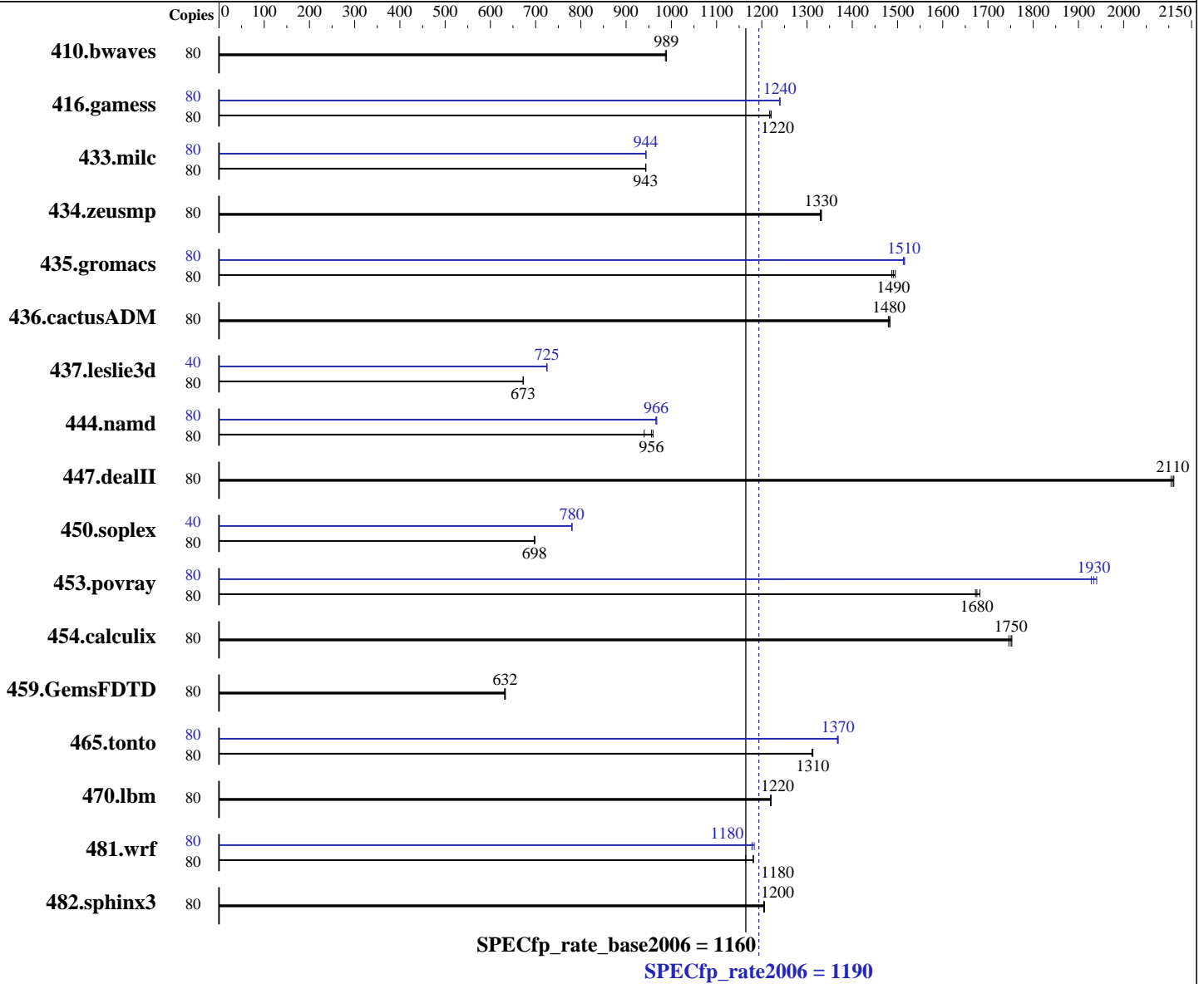
Test sponsor: Huawei

Tested by: Huawei

Test date: Jul-2014

Hardware Availability: Feb-2014

Software Availability: Sep-2013



Hardware

CPU Name: Intel Xeon E5-4650 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
 CPU(s) orderable: 2,4 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 6.4 (Santiago)
 2.6.32-358.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: 25 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem: 4 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 | 80 | 1099 | 989 | <u>1099</u> | <u>989</u> | 1102 | 987 | 80 | 1099 | 989 | <u>1099</u> | <u>989</u> | 1102 | 987 |
| 416.gamess | 80 | 1283 | 1220 | <u>1286</u> | <u>1220</u> | 1287 | 1220 | 80 | <u>1263</u> | <u>1240</u> | 1263 | 1240 | 1264 | 1240 |
| 433.milc | 80 | <u>778</u> | <u>943</u> | 778 | 944 | 778 | 943 | 80 | 778 | 944 | 778 | 944 | <u>778</u> | <u>944</u> |
| 434.zeusmp | 80 | <u>547</u> | <u>1330</u> | 548 | 1330 | 547 | 1330 | 80 | <u>547</u> | <u>1330</u> | 548 | 1330 | 547 | 1330 |
| 435.gromacs | 80 | 384 | 1490 | <u>383</u> | <u>1490</u> | 382 | 1500 | 80 | 377 | 1520 | 378 | 1510 | <u>377</u> | <u>1510</u> |
| 436.cactusADM | 80 | 646 | 1480 | 644 | 1480 | <u>645</u> | <u>1480</u> | 80 | 646 | 1480 | 644 | 1480 | <u>645</u> | <u>1480</u> |
| 437.leslie3d | 80 | <u>1118</u> | <u>673</u> | 1118 | 672 | 1117 | 673 | 40 | <u>519</u> | <u>725</u> | 518 | 725 | 519 | 725 |
| 444.namd | 80 | 683 | 940 | 669 | 960 | <u>671</u> | <u>956</u> | 80 | 663 | 968 | <u>664</u> | <u>966</u> | 664 | 966 |
| 447.dealII | 80 | 435 | 2100 | <u>434</u> | <u>2110</u> | 434 | 2110 | 80 | 435 | 2100 | <u>434</u> | <u>2110</u> | 434 | 2110 |
| 450.soplex | 80 | <u>956</u> | <u>698</u> | 957 | 697 | 956 | 698 | 40 | <u>428</u> | <u>780</u> | 428 | 780 | 428 | 780 |
| 453.povray | 80 | 254 | 1670 | 253 | 1680 | <u>254</u> | <u>1680</u> | 80 | 219 | 1940 | 221 | 1930 | <u>220</u> | <u>1930</u> |
| 454.calculix | 80 | 377 | 1750 | 378 | 1750 | <u>377</u> | <u>1750</u> | 80 | 377 | 1750 | 378 | 1750 | <u>377</u> | <u>1750</u> |
| 459.GemsFDTD | 80 | 1344 | 631 | <u>1342</u> | <u>632</u> | 1340 | 633 | 80 | 1344 | 631 | <u>1342</u> | <u>632</u> | 1340 | 633 |
| 465.tonto | 80 | 600 | 1310 | <u>600</u> | <u>1310</u> | 600 | 1310 | 80 | <u>575</u> | <u>1370</u> | 576 | 1370 | 575 | 1370 |
| 470.lbm | 80 | <u>901</u> | <u>1220</u> | 901 | 1220 | 902 | 1220 | 80 | <u>901</u> | <u>1220</u> | 901 | 1220 | 902 | 1220 |
| 481.wrf | 80 | 756 | 1180 | 767 | 1160 | <u>757</u> | <u>1180</u> | 80 | 758 | 1180 | 755 | 1180 | <u>758</u> | <u>1180</u> |
| 482.sphinx3 | 80 | 1293 | 1210 | <u>1295</u> | <u>1200</u> | 1295 | 1200 | 80 | 1293 | 1210 | <u>1295</u> | <u>1200</u> | 1295 | 1200 |

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 Lock_step to disabled

Continued on next page



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Platform Notes (Continued)

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 RH2485 Sat Jul 5 03:02:42 2014

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 E5-4650 v2 @ 2.40GHz
 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 : 25600 KB
```

```
From /proc/meminfo
MemTotal: 529226604 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.4 (Santiago)
```

```
From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
Linux RH2485 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013 x86_64
x86_64 x86_64 GNU/Linux
```

```
run-level 3 Jul 4 14:09
```

```
SPEC is set to: /spec
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext4 962G 139G 774G 16% /
```

```
Additional information from dmidecode:
BIOS Insyde Corp. RMIBV6XX13 07/02/2014
Memory:
32x Hynix HMT42GR7AFR4C-RD 16 GB 1867 MHz 2 rank
16x NO DIMM NO DIMM 1867 MHz
```

Continued on next page



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Platform Notes (Continued)

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 512 GB and the dmidecode description should have one line reading as:
32x Hynix HMT42GR7AFR4C-RD 16 GB 1867 MHz 2 rank

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

Continued on next page



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Base Portability Flags (Continued)

```
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:

```
-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:

```
icc -m64
```

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
```



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Tested by: Huawei

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Software Availability: Sep-2013

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
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: -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: basepeak = yes

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) -unroll14 -ansi-alias

```

Fortran benchmarks:

Continued on next page



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Peak Optimization Flags (Continued)

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

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>

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Tested with SPEC CPU2006 v1.2.
Report generated on Wed Jul 30 10:53:39 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 29 July 2014.