SPEC® CFP2006 Result
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Huawei

Huawei CH242 V3 (Intel Xeon E7-4809 v4)

$SPECfp^{®}\_rate2006 =$ 1000

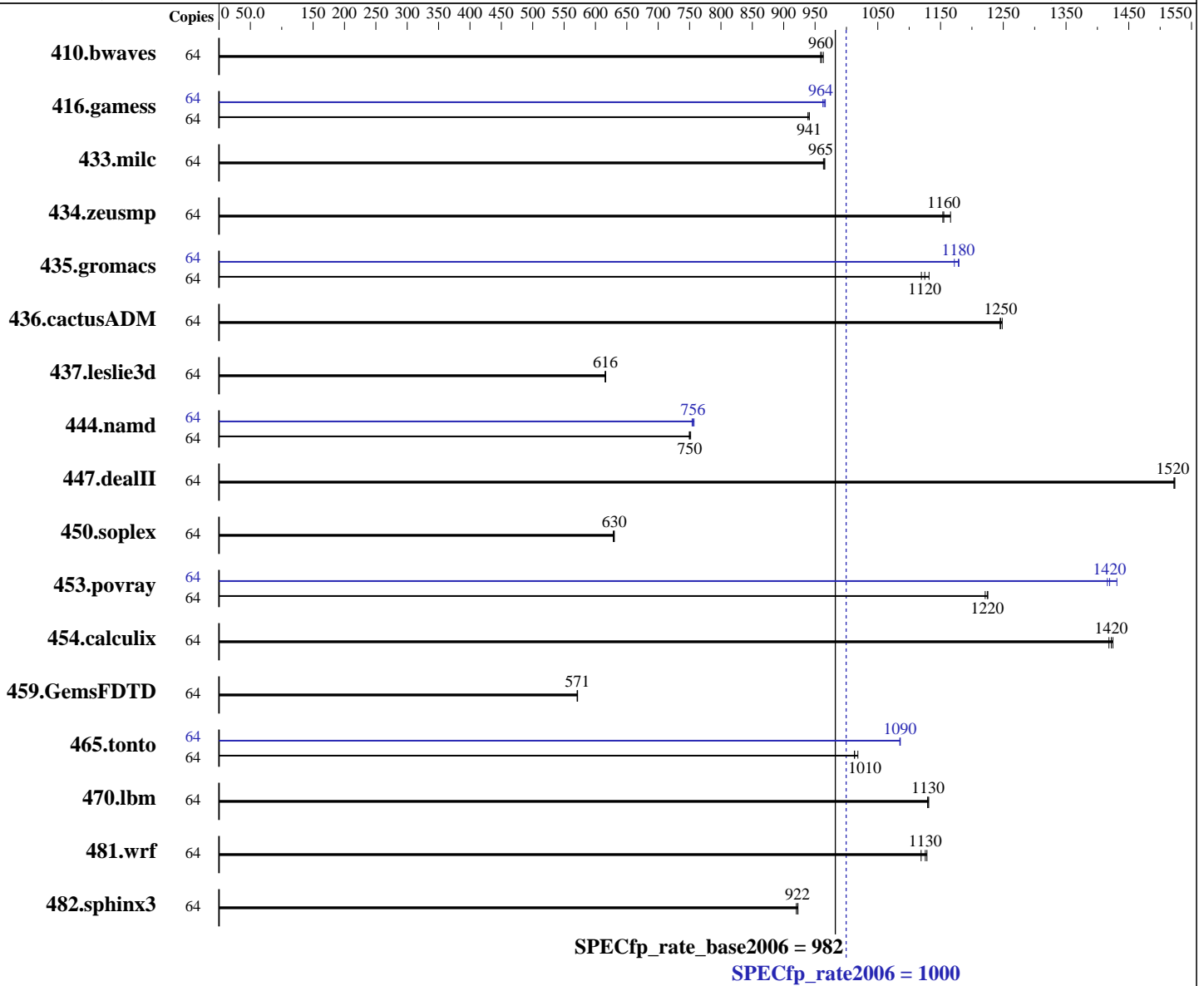$SPECfp\_rate\_base2006 =$ 982

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

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

Benchmark	Copies	Result
410.bwaves	64	960
416.gamess	64	964
416.gamess	64	941
433.milc	64	965
434.zeusmp	64	1160
435.gromacs	64	1180
435.gromacs	64	1120
436.cactusADM	64	1250
437.leslie3d	64	616
444.namd	64	756
444.namd	64	750
447.dealII	64	1520
450.soplex	64	630
453.povray	64	1420
453.povray	64	1220
454.calculix	64	1420
459.GemsFDTD	64	571
465.tonto	64	1090
465.tonto	64	1010
470.lbm	64	1130
481.wrf	64	1130
482.sphinx3	64	922

SPECfp_rate_base2006 = 982

SPECfp_rate2006 = 1000

Hardware

CPU Name: Intel Xeon E7-4809 v4
CPU Characteristics:
CPU MHz: 2100
FPU: Integrated
CPU(s) enabled: 32 cores, 4 chips, 8 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 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
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 32-bit

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L3 Cache:	20 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (32 x 16 GB 2Rx8 PC4-2400T-R, running at 1333 MHz)
Disk Subsystem:	1 x 480 GB SSD
Other Hardware:	None
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	64	907	959	903	963	**906**	**960**	64	907	959	903	963	**906**	**960**
416.gamess	64	1332	941	**1332**	**941**	1335	939	64	1297	966	1302	963	**1299**	**964**
433.milc	64	610	963	**609**	**965**	608	966	64	610	963	**609**	**965**	608	966
434.zeusmp	64	500	1170	505	1150	**504**	**1160**	64	500	1170	505	1150	**504**	**1160**
435.gromacs	64	**406**	**1120**	408	1120	404	1130	64	387	1180	390	1170	**388**	**1180**
436.cactusADM	64	614	1240	613	1250	**614**	**1250**	64	614	1240	613	1250	**614**	**1250**
437.leslie3d	64	**977**	**616**	976	616	978	615	64	**977**	**616**	976	616	978	615
444.namd	64	**684**	**750**	683	752	685	750	64	681	754	678	757	**679**	**756**
447.dealII	64	**481**	**1520**	481	1520	481	1520	64	**481**	**1520**	481	1520	481	1520
450.soplex	64	847	630	849	628	**847**	**630**	64	847	630	849	628	**847**	**630**
453.povray	64	278	1230	279	1220	**278**	**1220**	64	**240**	**1420**	238	1430	240	1420
454.calculix	64	372	1420	371	1420	**371**	**1420**	64	372	1420	371	1420	**371**	**1420**
459.GemsFDTD	64	**1189**	**571**	1190	571	1188	572	64	**1189**	**571**	1190	571	1188	572
465.tonto	64	**622**	**1010**	622	1010	618	1020	64	580	1090	580	1090	**580**	**1090**
470.lbm	64	777	1130	779	1130	**778**	**1130**	64	777	1130	779	1130	**778**	**1130**
481.wrf	64	634	1130	639	1120	**635**	**1130**	64	634	1130	639	1120	**635**	**1130**
482.sphinx3	64	**1353**	**922**	1352	923	1356	920	64	**1353**	**922**	1352	923	1356	920

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"

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CPU2006 license: 3175		**Test date:**	Nov-2016
Test sponsor: Huawei		**Hardware Availability:**	Jun-2016
Tested by: Huawei		**Software Availability:**	Nov-2015

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
Set COD Mode to enabled
Sysinfo program /spec16/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Fri Nov 18 02:38:12 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 E7-4809 v4 @ 2.10GHz
      4 "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 : 8
      siblings  : 16
      physical 0: cores 0 1 2 3 4 5 6 7
      physical 1: cores 0 1 2 3 4 5 6 7
      physical 2: cores 0 1 2 3 4 5 6 7
      physical 3: cores 0 1 2 3 4 5 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:      528080572 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
```

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Platform Notes (Continued)

```
run-level 3 Nov 17 09:41

SPEC is set to: /spec16
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda1       ext4  407G   65G  322G  17% /
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. BLISV778 09/22/2016
  Memory:
   32x Hynix HMA82GR7AFR8N-UH 16 GB 2 rank 2400 MHz, configured at 1333 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

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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
```

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Peak Compiler Invocation (Continued)

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: 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: basepeak = yes

>   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

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Peak Optimization Flags (Continued)

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

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

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

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