SPEC® CFP2006 Result
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Fujitsu

PRIMEQUEST 2800E3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp^®\_rate2006 =$ 3960

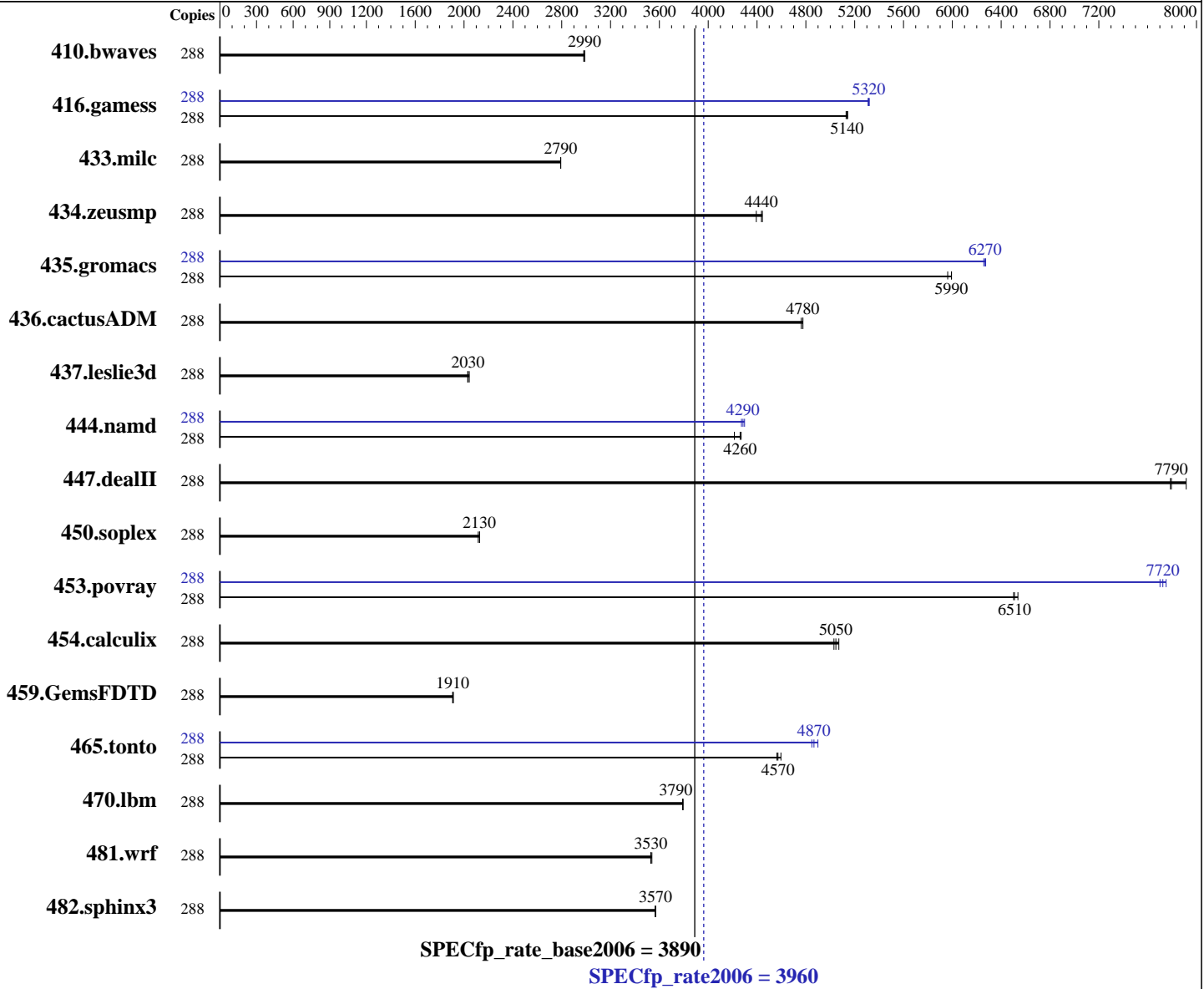$SPECfp\_rate\_base2006 =$ 3890

CPU2006 license: 19

Test sponsor: Fujitsu

Tested by: Fujitsu

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Sep-2015

Copies		
410.bwaves	288	2990
416.gamess	288	5320
	288	5140
433.milc	288	2790
434.zeusmp	288	4440
435.gromacs	288	6270
	288	5990
436.cactusADM	288	4780
437.leslie3d	288	2030
444.namd	288	4290
	288	4260
447.dealII	288	7790
450.soplex	288	2130
453.povray	288	7720
	288	6510
454.calculix	288	5050
459.GemsFDTD	288	1910
465.tonto	288	4870
	288	4570
470.lbm	288	3790
481.wrf	288	3530
482.sphinx3	288	3570

SPECfp_rate_base2006 = 3890

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Hardware

CPU Name: Intel Xeon E7-8860 v4

CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz

CPU MHz: 2200

FPU: Integrated

CPU(s) enabled: 144 cores, 8 chips, 18 cores/chip, 2 threads/core

CPU(s) orderable: 2,4,6,8 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: SUSE Linux Enterprise Server 12 SP1 (x86_64)
Kernel 3.12.49-11-default

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

System State: Run level 3 (multi-user)

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L3 Cache:	45 MB I+D on chip per chip	Base Pointers:	32/64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	1 TB (64 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)	Other Software:	None
Disk Subsystem:	1 x SATA, 1000 GB, 10000 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	288	1310	2990	**1310**	**2990**	1313	2980	288	1310	2990	**1310**	**2990**	1313	2980
416.gamess	288	1097	5140	1099	5130	**1098**	**5140**	288	1062	5310	1060	5320	**1061**	**5320**
433.milc	288	**947**	**2790**	947	2790	947	2790	288	**947**	**2790**	947	2790	947	2790
434.zeusmp	288	596	4390	**591**	**4440**	590	4440	288	596	4390	**591**	**4440**	590	4440
435.gromacs	288	**343**	**5990**	345	5960	343	5990	288	329	6260	328	6270	**328**	**6270**
436.cactusADM	288	**721**	**4780**	721	4780	723	4760	288	**721**	**4780**	721	4780	723	4760
437.leslie3d	288	**1332**	**2030**	1325	2040	1334	2030	288	**1332**	**2030**	1325	2040	1334	2030
444.namd	288	541	4270	**542**	**4260**	548	4210	288	541	4270	**539**	**4290**	537	4300
447.dealII	288	423	7790	**423**	**7790**	416	7920	288	423	7790	**423**	**7790**	416	7920
450.soplex	288	1135	2120	1129	2130	**1129**	**2130**	288	1135	2120	1129	2130	**1129**	**2130**
453.povray	288	236	6500	**235**	**6510**	234	6540	288	**198**	**7720**	198	7750	199	7700
454.calculix	288	**471**	**5050**	472	5030	469	5070	288	**471**	**5050**	472	5030	469	5070
459.GemsFDTD	288	1602	1910	**1602**	**1910**	1598	1910	288	1602	1910	**1602**	**1910**	1598	1910
465.tonto	288	**620**	**4570**	617	4600	621	4560	288	578	4900	584	4850	**582**	**4870**
470.lbm	288	1043	3790	1044	3790	**1043**	**3790**	288	1043	3790	1044	3790	**1043**	**3790**
481.wrf	288	**911**	**3530**	911	3530	909	3540	288	**911**	**3530**	911	3530	909	3540
482.sphinx3	288	**1573**	**3570**	1574	3570	1573	3570	288	**1573**	**3570**	1574	3570	1573	3570

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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Tested by: Fujitsu

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

Platform Notes

```
BIOS configuration:
Energy Performance = Performance
Uncore Frequency Override = Maximum
Sysinfo program /home/SPECcpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-8do3 Wed Jun  8 02:49:33 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 E7-8860 v4 @ 2.20GHz
      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:      1058678360 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12 SP1

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 1
      # This file is deprecated and will be removed in a future service pack or
      release.
      # Please check /etc/os-release for details about this release.
   os-release:
      NAME="SLES"
      VERSION="12-SP1"
      VERSION_ID="12.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
      ID="sles"
```

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Test sponsor: Fujitsu		**Hardware Availability:**	Jun-2016
Tested by: Fujitsu		**Software Availability:**	Sep-2015

Platform Notes (Continued)

```
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp1"

  uname -a:
     Linux linux-8do3 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
     (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Jun 7 13:59 last=5

  SPEC is set to: /home/SPECcpu2006
     Filesystem      Type   Size  Used Avail Use% Mounted on
     /dev/sda4       xfs    982G  253G  730G  26% /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 FUJITSU PRIMEQUEST 2000 Series BIOS Version 81.14 04/18/2016
   Memory:
   64x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz, configured at 1600 MHz
   128x Not Specified Not Specified

  (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/SPECcpu2006/libs/32:/home/SPECcpu2006/libs/64:/home/SPECcpu2006/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>
 For information about Fujitsu please visit: http://www.fujitsu.com
```

Base Compiler Invocation

C benchmarks:
    icc   -m64

C++ benchmarks:
    icpc   -m64

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Base Compiler Invocation (Continued)

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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Hardware Availability: Jun-2016
Software Availability: Sep-2015

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: 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

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Peak Optimization Flags (Continued)

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

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/Fujitsu-Platform-Settings-V1.2-BDW-RevB.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/Fujitsu-Platform-Settings-V1.2-BDW-RevB.xml

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

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