SPEC® CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp^{®}\_rate2006 = \quad 2130$

$SPECfp\_rate\_base2006 = \quad 2080$

CPU2006 license: 19	**Test date:** Jul-2016
Test sponsor: Fujitsu	**Hardware Availability:** Jun-2016
Tested by: Fujitsu	**Software Availability:** Sep-2015

Copies

Benchmark	Copies	Result
410.bwaves	144	1620
416.gamess	144	2710
416.gamess	144	2630
433.milc	144	1520
434.zeusmp	144	2310
435.gromacs	144	3270
435.gromacs	144	3130
436.cactusADM	144	2540
437.leslie3d	144	1080
444.namd	144	2190
444.namd	144	2170
447.dealII	144	4020
450.soplex	72	1260
450.soplex	144	1150
453.povray	144	4010
453.povray	144	3400
454.calculix	144	3470
459.GemsFDTD	144	987
465.tonto	144	2520
465.tonto	144	2360
470.lbm	144	1990
481.wrf	144	1880
482.sphinx3	144	1950

SPECfp_rate_base2006 = 2080

SPECfp_rate2006 = 2130

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:	72 cores, 4 chips, 18 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:	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)

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz
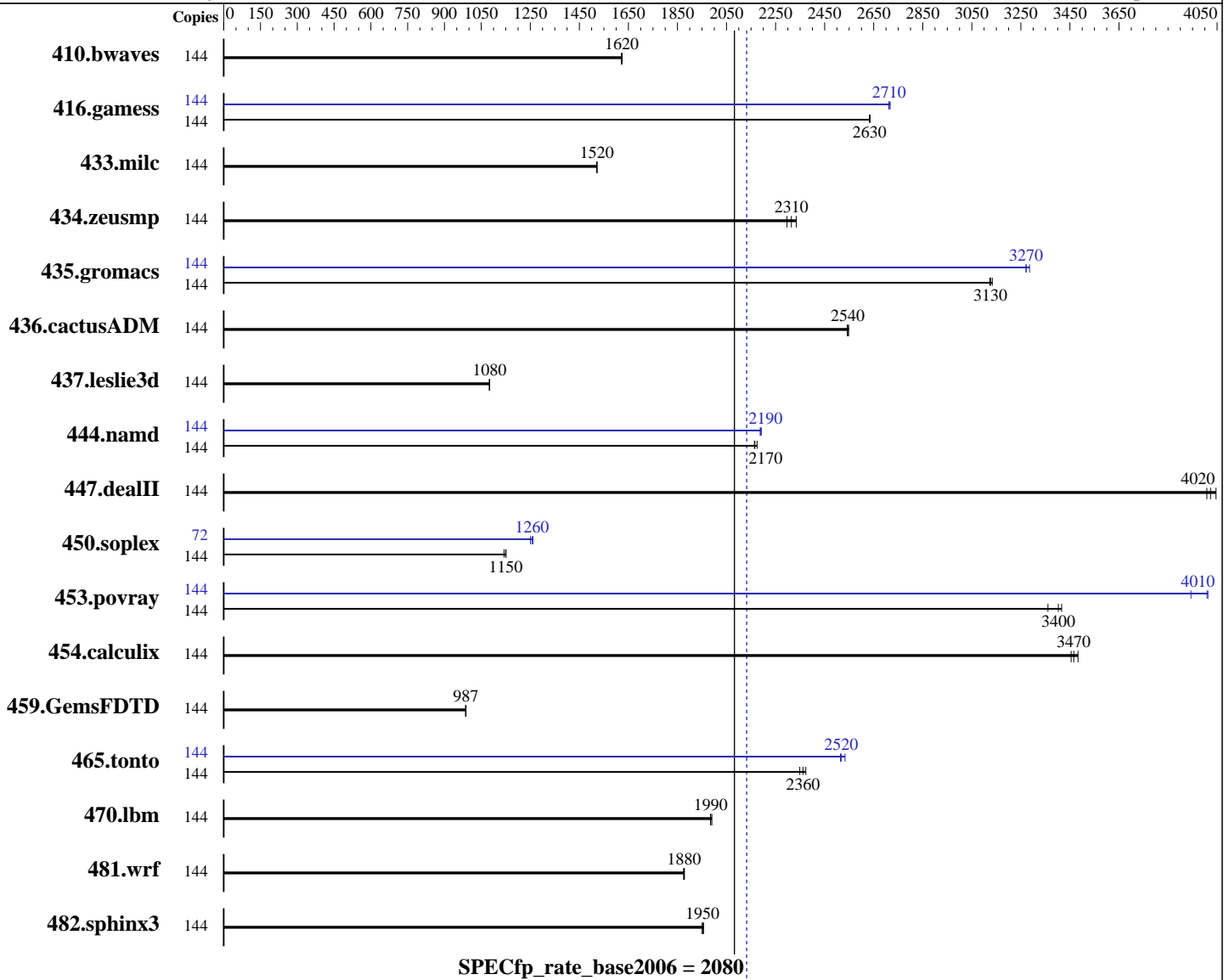
SPECfp_rate2006 = 2130

SPECfp_rate_base2006 = 2080

CPU2006 license: 19	**Test date:** Jul-2016
Test sponsor: Fujitsu	**Hardware Availability:** Jun-2016
Tested by: Fujitsu	**Software Availability:** Sep-2015

L3 Cache:	45 MB I+D on chip per chip	Base Pointers:	32/64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	512 GB (32 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	144	1205	1620	1207	1620	**1205**	**1620**	144	1205	1620	1207	1620	**1205**	**1620**
416.gamess	144	**1071**	**2630**	1070	2630	1071	2630	144	**1039**	**2710**	1038	2720	1040	2710
433.milc	144	**869**	**1520**	869	1520	868	1520	144	**869**	**1520**	869	1520	868	1520
434.zeusmp	144	571	2300	561	2330	**566**	**2310**	144	571	2300	561	2330	**566**	**2310**
435.gromacs	144	329	3120	328	3130	**329**	**3130**	144	314	3270	313	3290	**314**	**3270**
436.cactusADM	144	677	2540	**676**	**2540**	675	2550	144	677	2540	**676**	**2540**	675	2550
437.leslie3d	144	1248	1080	1250	1080	**1249**	**1080**	144	1248	1080	1250	1080	**1249**	**1080**
444.namd	144	531	2170	**533**	**2170**	534	2160	144	527	2190	**528**	**2190**	528	2190
447.dealII	144	**409**	**4020**	411	4010	407	4050	144	**409**	**4020**	411	4010	407	4050
450.soplex	144	1051	1140	**1045**	**1150**	1043	1150	72	480	1250	**478**	**1260**	476	1260
453.povray	144	**225**	**3400**	224	3420	228	3360	144	191	4010	194	3940	**191**	**4010**
454.calculix	144	**343**	**3470**	344	3450	341	3480	144	**343**	**3470**	344	3450	341	3480
459.GemsFDTD	144	**1548**	**987**	1547	988	1550	986	144	**1548**	**987**	1547	988	1550	986
465.tonto	144	603	2350	597	2370	**600**	**2360**	144	**563**	**2520**	559	2530	564	2510
470.lbm	144	**997**	**1990**	994	1990	997	1980	144	**997**	**1990**	994	1990	997	1980
481.wrf	144	856	1880	858	1870	**857**	**1880**	144	856	1880	858	1870	**857**	**1880**
482.sphinx3	144	1439	1950	**1437**	**1950**	1435	1960	144	1439	1950	**1437**	**1950**	1435	1960

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:
Energy Performance = Performance
QPI snoop mode: Cluster on Die

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp\_rate2006 =$ 2130

$SPECfp\_rate\_base2006 =$ 2080

CPU2006 license: 19
Test sponsor: Fujitsu
Tested by: Fujitsu

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

Platform Notes (Continued)

```
Sysinfo program /home/SPECcpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-l2iu Sat Jul  9 05:03:23 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
      4 "physical id"s (chips)
      144 "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
   cache size : 23040 KB

From /proc/meminfo
   MemTotal:       529265312 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"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
   Linux linux-l2iu 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
   (8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp\_rate2006 =$　　2130

$SPECfp\_rate\_base2006 =$　2080

CPU2006 license: 19		**Test date:**	Jul-2016
Test sponsor:	Fujitsu	**Hardware Availability:**	Jun-2016
Tested by:	Fujitsu	**Software Availability:**	Sep-2015

Platform Notes (Continued)

```
run-level 3 Jul 8 16:51 last=5

SPEC is set to: /home/SPECcpu2006
   Filesystem      Type   Size   Used  Avail  Use%  Mounted on
   /dev/sda3       xfs    1.1T   128G  948G   12%   /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 // American Megatrends Inc. V5.0.0.11 R1.0.0 for D3749-A1x
  03/31/2016
  Memory:
  32x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz, configured at 1600 MHz
  64x NO DIMM NO DIMM

(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

Fortran benchmarks:
　　ifort -m64

Benchmarks using both Fortran and C:
　　icc   -m64 ifort -m64

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp\_rate2006 =$ 2130

$SPECfp\_rate\_base2006 =$ 2080

CPU2006 license: 19	**Test date:** Jul-2016
Test sponsor: Fujitsu	**Hardware Availability:** Jun-2016
Tested by: Fujitsu	**Software Availability:** Sep-2015

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 (except as noted below):

```
icpc  -m64
```

```
 450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

SPECfp_rate2006 =   2130

SPECfp_rate_base2006 = 2080

CPU2006 license: 19
Test sponsor: Fujitsu
Tested by: Fujitsu

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

Peak Compiler Invocation (Continued)

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
    450.soplex: -D_FILE_OFFSET_BITS=64
    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: 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
```

Continued on next page

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp_rate2006 = $ 2130

$SPECfp_rate_base2006 = $ 2080

CPU2006 license: 19		**Test date:**	Jul-2016
Test sponsor:	Fujitsu	**Hardware Availability:**	Jun-2016
Tested by:	Fujitsu	**Software Availability:**	Sep-2015

Peak Optimization Flags (Continued)

450.soplex: -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-malloc-options=3

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

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

Fujitsu

PRIMERGY RX4770 M3, Intel Xeon E7-8860 v4, 2.20 GHz

$SPECfp\_rate2006 = \quad 2130$

$SPECfp\_rate\_base2006 = \quad 2080$

CPU2006 license: 19
Test sponsor: Fujitsu
Tested by: Fujitsu

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

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

Tested with SPEC CPU2006 v1.2.
Report generated on Tue Oct 4 14:49:55 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 4 October 2016.