SPEC® CFP2006 Result
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Fujitsu

PRIMERGY BX2560 M2, Intel Xeon E5-2640 v4, 2.40 GHz

$SPECfp^{®}2006 =$ 119

$SPECfp\_base2006 =$ 112

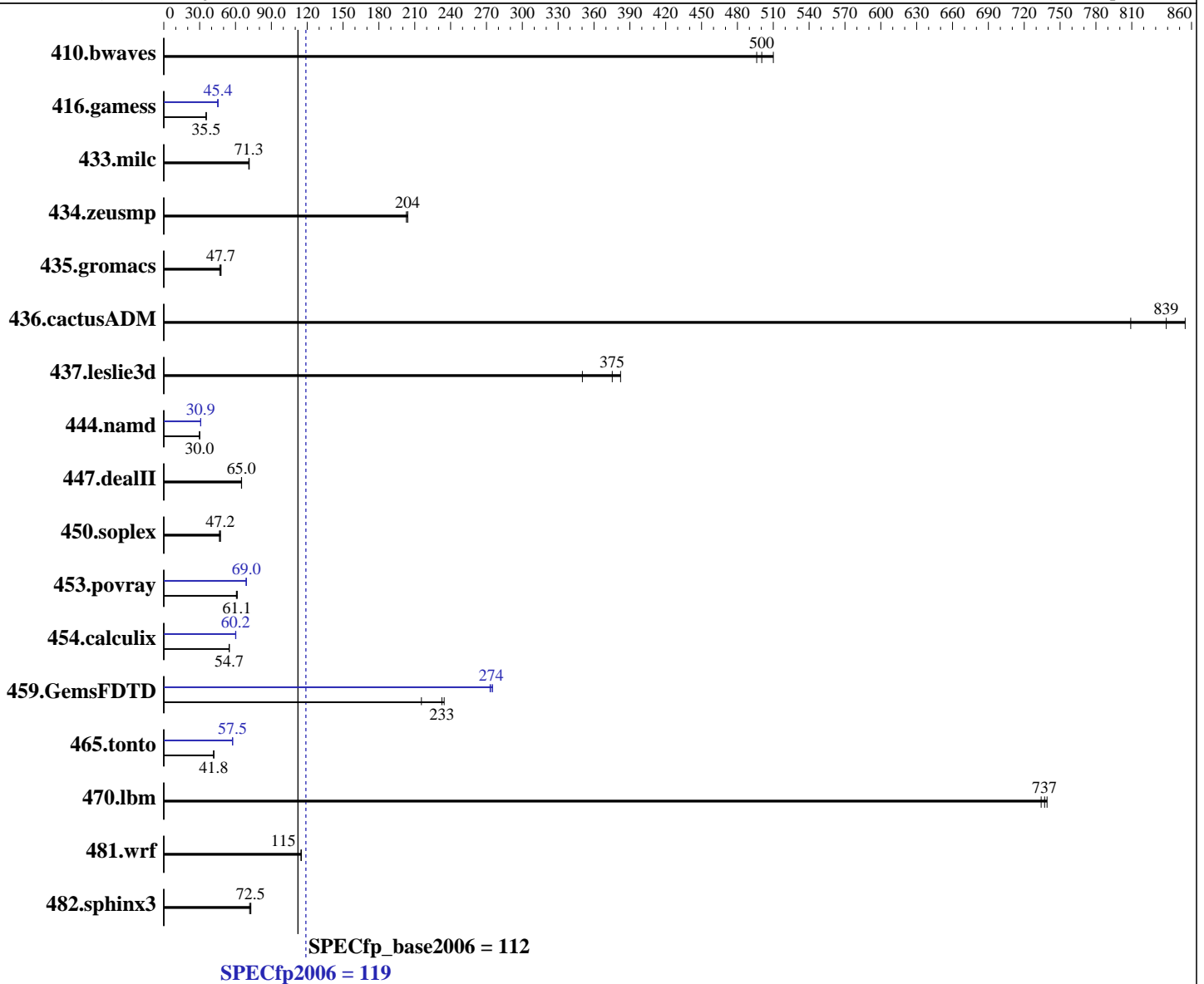|			
CPU2006 license:	19	**Test date:**	Jun-2016
Test sponsor:	Fujitsu	**Hardware Availability:**	Apr-2016
Tested by:	Fujitsu	**Software Availability:**	Sep-2015

Scale: 0 30.0 60.0 90.0 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630 660 690 720 750 780 810 860

- 410.bwaves — 500
- 416.gamess — 45.4 / 35.5
- 433.milc — 71.3
- 434.zeusmp — 204
- 435.gromacs — 47.7
- 436.cactusADM — 839
- 437.leslie3d — 375
- 444.namd — 30.9 / 30.0
- 447.dealII — 65.0
- 450.soplex — 47.2
- 453.povray — 69.0 / 61.1
- 454.calculix — 60.2 / 54.7
- 459.GemsFDTD — 274 / 233
- 465.tonto — 57.5 / 41.8
- 470.lbm — 737
- 481.wrf — 115
- 482.sphinx3 — 72.5

SPECfp_base2006 = 112

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Hardware

CPU Name:	Intel Xeon E5-2640 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 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:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)

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L3 Cache:	25 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)	Other Software:	None
Disk Subsystem:	1 x SATA, 500 GB, 7200 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**27.2**	**500**	26.6	510	27.4	496	**27.2**	**500**	26.6	510	27.4	496
416.gamess	553	35.4	**551**	**35.5**	551	35.5	435	45.0	431	45.4	**431**	**45.4**
433.milc	129	71.1	**129**	**71.3**	128	71.5	129	71.1	**129**	**71.3**	128	71.5
434.zeusmp	44.6	204	44.8	203	**44.6**	**204**	44.6	204	44.8	203	**44.6**	**204**
435.gromacs	**150**	**47.7**	153	46.8	149	47.9	**150**	**47.7**	153	46.8	149	47.9
436.cactusADM	14.0	855	**14.2**	**839**	14.8	809	14.0	855	**14.2**	**839**	14.8	809
437.leslie3d	24.6	382	26.8	350	**25.0**	**375**	24.6	382	26.8	350	**25.0**	**375**
444.namd	268	30.0	268	29.9	**268**	**30.0**	**260**	**30.9**	260	30.9	260	30.9
447.dealII	**176**	**65.0**	176	65.0	176	65.1	**176**	**65.0**	176	65.0	176	65.1
450.soplex	179	46.5	**177**	**47.2**	176	47.4	179	46.5	**177**	**47.2**	176	47.4
453.povray	87.6	60.7	86.5	61.5	**87.0**	**61.1**	77.3	68.8	**77.1**	**69.0**	76.9	69.2
454.calculix	**151**	**54.7**	151	54.8	151	54.7	**137**	**60.2**	137	60.3	137	60.1
459.GemsFDTD	**45.6**	**233**	49.2	216	45.2	235	**38.7**	**274**	38.9	273	38.6	275
465.tonto	236	41.7	**235**	**41.8**	235	41.9	171	57.6	171	57.5	**171**	**57.5**
470.lbm	18.7	734	**18.6**	**737**	18.6	739	18.7	734	**18.6**	**737**	18.6	739
481.wrf	97.2	115	**97.2**	**115**	97.0	115	97.2	115	**97.2**	**115**	97.0	115
482.sphinx3	271	71.8	268	72.9	**269**	**72.5**	271	71.8	268	72.9	**269**	**72.5**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
BIOS configuration:
Energy Performance = Performance
Utilization Profile = Unbalanced
QPI snoop mode: Home Snoop
    COD Enable = Disabled, Early Snoop = Disabled, Home Snoop Dir OSB = Disabled
CPU C1E Support = Disabled
Sysinfo program /home/SPECcpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on BX2560M2-T-313 Mon Jun 20 10:25:36 2016
```

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Test sponsor: Fujitsu
Tested by: Fujitsu

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

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 E5-2640 v4 @ 2.40GHz
         2 "physical id"s (chips)
         40 "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
      cache size : 25600 KB

   From /proc/meminfo
      MemTotal:       264516416 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 BX2560M2-T-313 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 20 10:24 last=5

   SPEC is set to: /home/SPECcpu2006
      Filesystem      Type   Size   Used Avail Use% Mounted on
      /dev/sda3       xfs    424G    78G  347G  19% /home
```

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Platform Notes (Continued)

```
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 R1.4.0 for D3320-B1x
  03/17/2016
  Memory:
  8x Hyundai Electronics (Hynix) HMA42GR7AFR4N-UH 16 GB 2 rank 2133 MHz
  8x Micron Technology 36ASF2G72PZ-2G3A3 16 GB 2 rank 2133 MHz

(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/home/SPECcpu2006/libs/32:/home/SPECcpu2006/libs/64:/home/SPECcpu2006/sh"
OMP_NUM_THREADS = "20"

 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
 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
```

Base Portability Flags

```
     410.bwaves: -DSPEC_CPU_LP64
     416.gamess: -DSPEC_CPU_LP64
```

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Base Portability Flags (Continued)

```
   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 -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias
```

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
```

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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) -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) -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: -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 -opt-prefetch -parallel

     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) -inline-calloc

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Peak Optimization Flags (Continued)

465.tonto (continued):
`-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

435.gromacs: `basepeak = yes`

436.cactusADM: `basepeak = yes`

454.calculix: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

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

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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

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