SPEC® CFP2006 Result

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Supermicro

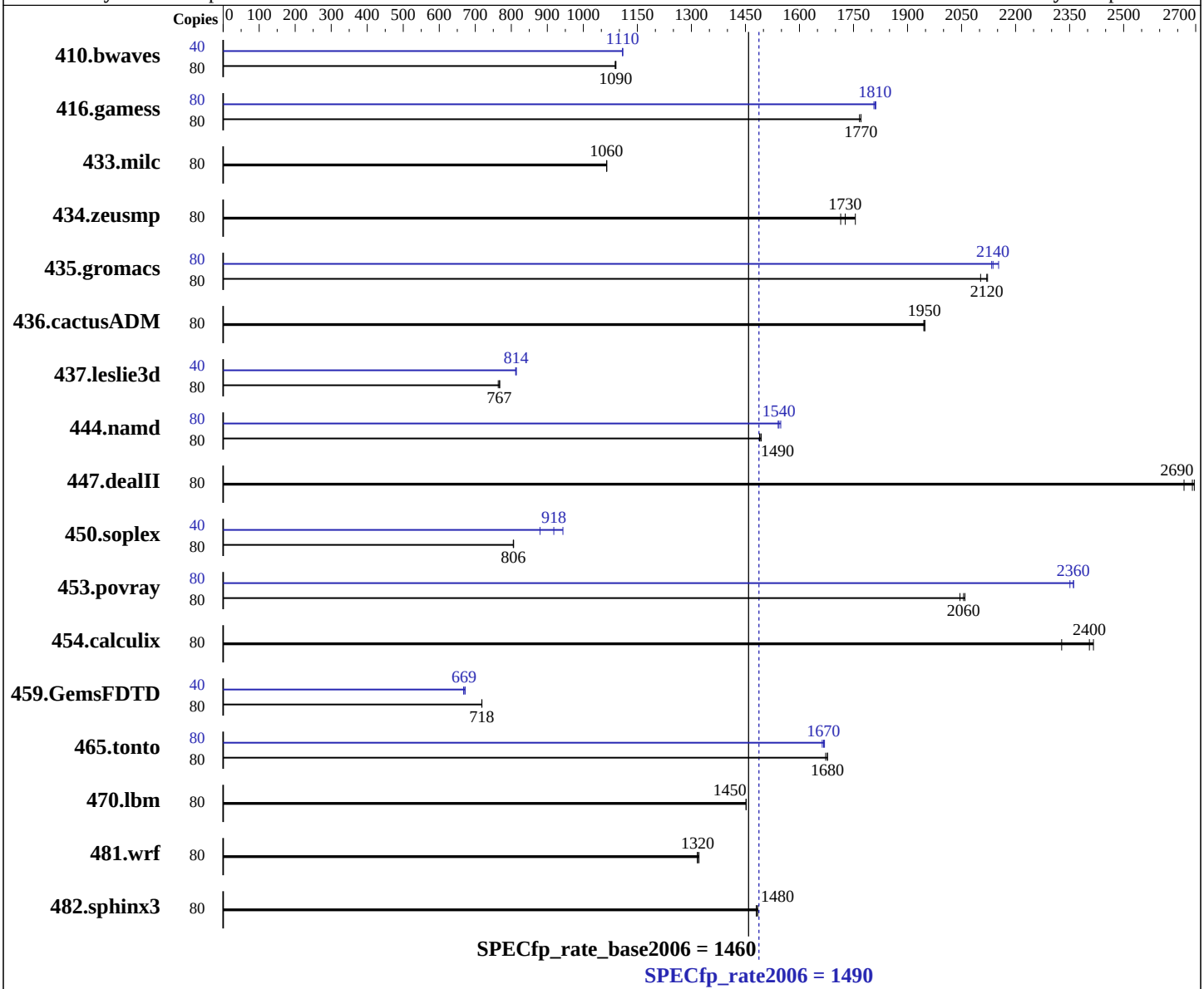
SuperServer 1029U-TN10RT (X11DPU , Intel Xeon Gold 6148)

SPECfp®_rate2006 = 1490

SPECfp_rate_base2006 = 1460

CPU2006 license: 001176
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Aug-2017
Hardware Availability: Jul-2017
Software Availability: Apr-2017



Hardware

CPU Name:	Intel Xeon Gold 6148
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	40 cores, 2 chips, 20 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core

Continued on next page

Software

Operating System:	SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default
Compiler:	C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux
Auto Parallel:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)

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L3 Cache: 27.5 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 1 TB SATAIII 7200RPM
Other Hardware: None

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	999	1090	997	1090	**997**	**1090**	40	490	1110	**490**	**1110**	490	1110
416.gamess	80	**885**	**1770**	885	1770	887	1770	80	**865**	**1810**	864	1810	867	1810
433.milc	80	**690**	**1060**	690	1070	690	1060	80	**690**	**1060**	690	1070	690	1060
434.zeusmp	80	425	1710	**422**	**1730**	415	1760	80	425	1710	**422**	**1730**	415	1760
435.gromacs	80	269	2120	**269**	**2120**	272	2100	80	**267**	**2140**	268	2130	265	2150
436.cactusADM	80	491	1950	**491**	**1950**	491	1950	80	491	1950	**491**	**1950**	491	1950
437.leslie3d	80	**980**	**767**	979	768	985	764	40	**462**	**814**	463	812	462	814
444.namd	80	**430**	**1490**	431	1490	429	1490	80	**416**	**1540**	414	1550	416	1540
447.dealII	80	343	2670	339	2700	**340**	**2690**	80	343	2670	339	2700	**340**	**2690**
450.soplex	80	**828**	**806**	828	805	827	807	40	354	943	**363**	**918**	379	880
453.povray	80	208	2050	207	2060	**207**	**2060**	80	**180**	**2360**	180	2360	181	2350
454.calculix	80	**274**	**2400**	273	2420	284	2330	80	**274**	**2400**	273	2420	284	2330
459.GemsFDTD	80	1182	718	**1182**	**718**	1182	718	40	631	672	636	668	**635**	**669**
465.tonto	80	**469**	**1680**	471	1670	469	1680	80	472	1670	**472**	**1670**	473	1660
470.lbm	80	**757**	**1450**	757	1450	757	1450	80	**757**	**1450**	757	1450	757	1450
481.wrf	80	679	1320	**678**	**1320**	676	1320	80	679	1320	**678**	**1320**	676	1320
482.sphinx3	80	1053	1480	1051	1480	**1053**	**1480**	80	1053	1480	1051	1480	**1053**	**1480**

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

```
Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-xa90 Fri Aug 18 10:43:39 2017
```

Continued on next page

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) Gold 6148 CPU @ 2.40GHz
      2 "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 : 20
      siblings  : 40
      physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
      physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
   cache size : 28160 KB

From /proc/meminfo
   MemTotal:       394615556 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 2
      # 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-SP2"
      VERSION_ID="12.2"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
   Linux linux-xa90 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
   (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 17 23:14

SPEC is set to: /home/cpu2006
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda7      xfs   889G   73G  817G   9% /home
```

Continued on next page

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 American Megatrends Inc. T20170720214342 07/20/2017
   Memory:
    24x Micron Technology 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz

 (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.2
 Transparent Huge Pages enabled by default
 Filesystem page cache cleared with:
 shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
 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

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Base Portability Flags (Continued)

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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-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_2017/linux/lib/ia32

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: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-ilp32
-qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -qopt-malloc-options=3
-qopt-mem-layout-trans=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3

Fortran benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

410.bwaves: `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`

416.gamess: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xCORE-AVX512`(pass 2)
`-par-num-threads=1`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
`-no-prec-div`(pass 2) `-unroll2 -inline-level=0 -scalar-rep-`

434.zeusmp: `basepeak = yes`

437.leslie3d: `Same as 410.bwaves`

459.GemsFDTD: `Same as 410.bwaves`

465.tonto: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xCORE-AVX512`(pass 2)
`-par-num-threads=1`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
`-no-prec-div`(pass 2) `-unroll4 -auto -inline-calloc`
`-qopt-malloc-options=3`

Benchmarks using both Fortran and C:

435.gromacs: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-xCORE-AVX512`(pass 2)
`-par-num-threads=1`(pass 1) `-qopt-prefetch -auto-ilp32`
`-qopt-mem-layout-trans=3`

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-ic17.0-official-linux64-revF.html`
`http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revH.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml`
`http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revH.xml`

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