SPEC® CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

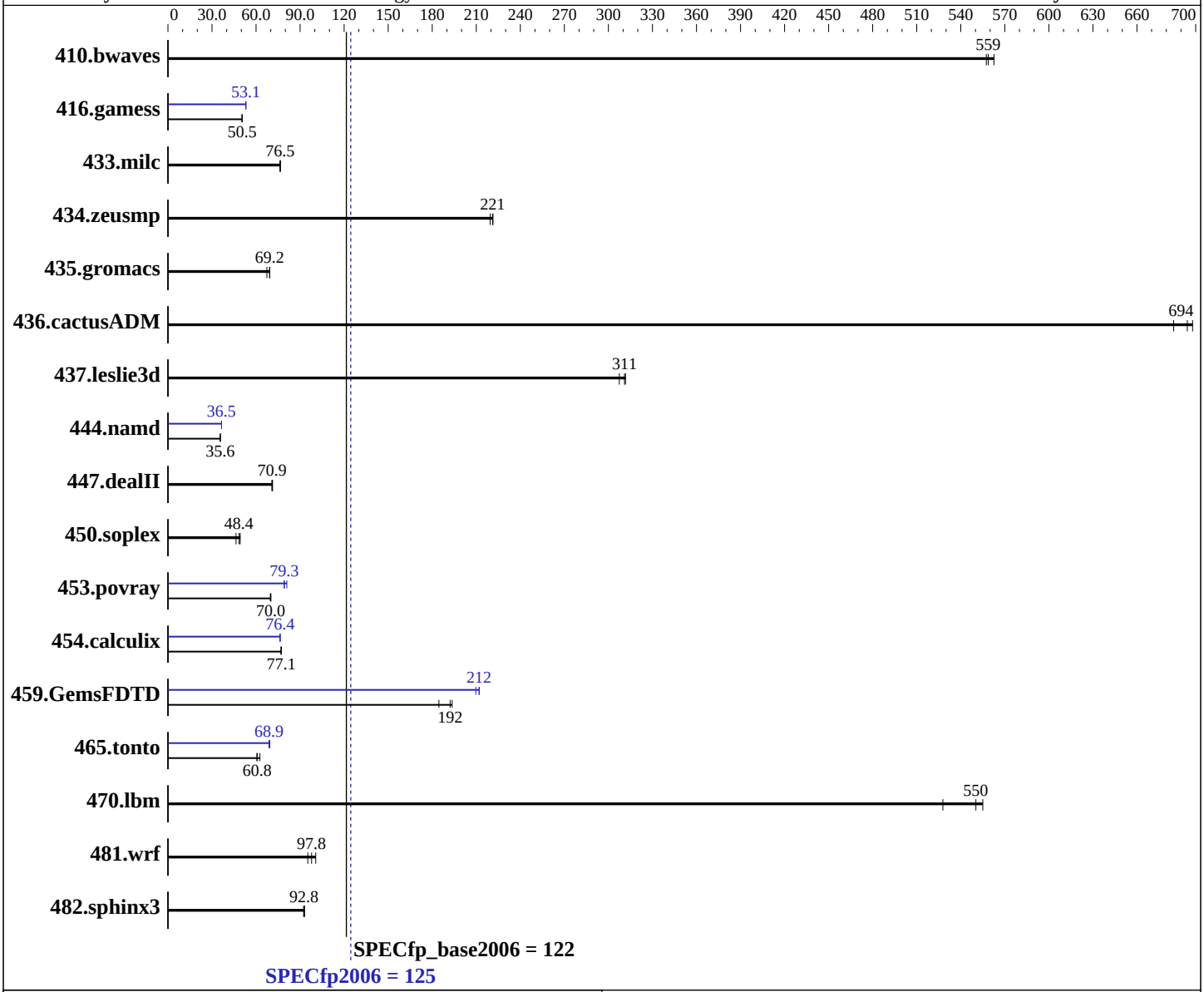
ThinkSystem ST550
(3.60 GHz, Intel Xeon Platinum 8156)

SPECfp®2006 = 125

SPECfp_base2006 = 122

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Sep-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016



Hardware

CPU Name:	Intel Xeon Platinum 8156
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3600
FPU:	Integrated
CPU(s) enabled:	8 cores, 2 chips, 4 cores/chip
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 (x86_64) Kernel 4.4.21-69-default
Compiler:	C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux
Auto Parallel:	Yes
File System:	btrfs
System State:	Run level 3 (multi-user)

Continued on next page

SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem ST550
(3.60 GHz, Intel Xeon Platinum 8156)

SPECfp2006 = 125

SPECfp_base2006 = 122

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Sep-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016

L3 Cache: 16.5 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24.4	557	24.2	563	**24.3**	**559**	24.4	557	24.2	563	**24.3**	**559**
416.gamess	388	50.5	388	50.5	**388**	**50.5**	**369**	**53.1**	369	53.0	369	53.1
433.milc	120	76.3	120	76.6	**120**	**76.5**	120	76.3	120	76.6	**120**	**76.5**
434.zeusmp	41.1	221	**41.2**	**221**	41.5	219	41.1	221	**41.2**	**221**	41.5	219
435.gromacs	103	69.3	106	67.4	**103**	**69.2**	103	69.3	106	67.4	**103**	**69.2**
436.cactusADM	17.1	698	17.4	685	**17.2**	**694**	17.1	698	17.4	685	**17.2**	**694**
437.leslie3d	30.6	307	30.2	312	**30.2**	**311**	30.6	307	30.2	312	**30.2**	**311**
444.namd	225	35.6	225	35.6	**225**	**35.6**	220	36.5	220	36.5	**220**	**36.5**
447.dealII	161	71.3	**161**	**70.9**	161	70.9	161	71.3	**161**	**70.9**	161	70.9
450.soplex	169	49.2	**172**	**48.4**	180	46.4	169	49.2	**172**	**48.4**	180	46.4
453.povray	75.9	70.1	76.3	69.7	**76.0**	**70.0**	65.7	81.0	67.2	79.2	**67.1**	**79.3**
454.calculix	107	77.2	**107**	**77.1**	107	77.0	108	76.4	**108**	**76.4**	108	76.2
459.GemsFDTD	54.8	194	**55.2**	**192**	57.5	185	50.6	210	50.0	212	**50.1**	**212**
465.tonto	157	62.7	163	60.6	**162**	**60.8**	142	69.4	143	68.8	**143**	**68.9**
470.lbm	24.8	555	**25.0**	**550**	26.0	528	24.8	555	**25.0**	**550**	26.0	528
481.wrf	117	95.3	**114**	**97.8**	111	101	117	95.3	**114**	**97.8**	111	101
482.sphinx3	209	93.0	**210**	**92.8**	211	92.4	209	93.0	**210**	**92.8**	211	92.4

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:
 Choose Operating Mode set to Maximum Performance
 Hyper-Threading set to Disable
 Per Core P-state set to Disable
 LLC dead line alloc set to Disable
Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on ST550 Thu Sep  7 17:26:21 2017

This section contains SUT (System Under Test) info as seen by
```

Continued on next page

Platform Notes (Continued)

```
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) Platinum 8156 CPU @ 3.60GHz
      2 "physical id"s (chips)
      8 "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 : 4
      siblings  : 4
      physical 0: cores 0 3 10 13
      physical 1: cores 1 5 9 13
   cache size : 16896 KB

From /proc/meminfo
   MemTotal:       395883768 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

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 ST550 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 Sep 7 17:24

SPEC is set to: /home/cpu2006-1.2-ic17.0
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/sda2      btrfs  744G  100G  644G  14% /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
```

Continued on next page

Platform Notes (Continued)

```
     hardware, firmware, and the "DMTF SMBIOS" standard.

    BIOS Lenovo -[O0E105R-1.00]- 04/27/2017
    Memory:
     12x Hynix HMA84GR7AFR4N-VK 32 GB 2 rank 2666 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"
LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic17.0/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2"
OMP_NUM_THREADS = "8"

 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.
```

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
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

Continued on next page

Base Portability Flags (Continued)

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 -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

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: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(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: basepeak = yes

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0
-qopt-prefetch -parallel

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3
-auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

Continued on next page

Peak Optimization Flags (Continued)

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

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.html`
`http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.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.xml`
`http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.xml`

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 Wed Oct 4 12:34:32 2017 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 3 October 2017.