SPEC® CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

$SPECfp^{®}2006 =$ 69.5

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

$SPECfp\_base2006 =$ 68.3

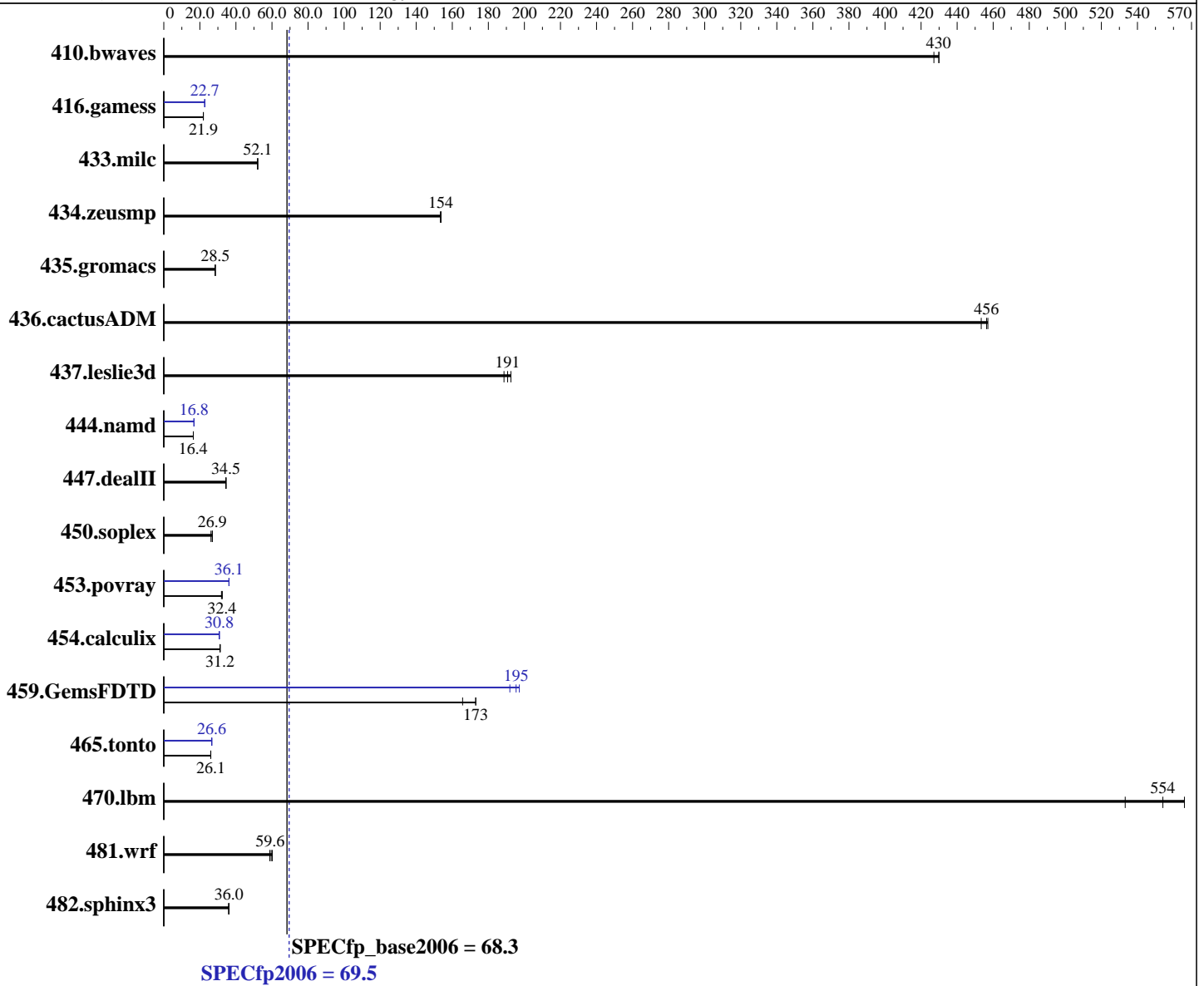**CPU2006 license:** 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

Benchmark	Result
410.bwaves	430
416.gamess	22.7 / 21.9
433.milc	52.1
434.zeusmp	154
435.gromacs	28.5
436.cactusADM	456
437.leslie3d	191
444.namd	16.8 / 16.4
447.dealII	34.5
450.soplex	26.9
453.povray	36.1 / 32.4
454.calculix	30.8 / 31.2
459.GemsFDTD	195 / 173
465.tonto	26.6 / 26.1
470.lbm	554
481.wrf	59.6
482.sphinx3	36.0

SPECfp_base2006 = 68.3
SPECfp2006 = 69.5

Hardware

CPU Name:	Intel Xeon Bronze 3104
CPU Characteristics:	
CPU MHz:	1700
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 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:	Red Hat Enterprise Linux Server release 7.3 (Maipo) Kernel 3.10.0-514.el7.x86_64
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:	xfs

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

SPECfp2006 =	69.5
SPECfp_base2006 =	68.3

L3 Cache:	8.25 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2133 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 800 GB SATA SSD		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	31.8	427	**31.6**	**430**	31.6	430	31.8	427	**31.6**	**430**	31.6	430
416.gamess	892	21.9	894	21.9	**893**	**21.9**	862	22.7	**862**	**22.7**	861	22.7
433.milc	176	52.1	176	52.0	**176**	**52.1**	176	52.1	176	52.0	**176**	**52.1**
434.zeusmp	59.2	154	59.3	153	**59.2**	**154**	59.2	154	59.3	153	**59.2**	**154**
435.gromacs	251	28.5	**250**	**28.5**	250	28.6	251	28.5	**250**	**28.5**	250	28.6
436.cactusADM	26.1	457	26.4	453	**26.2**	**456**	26.1	457	26.4	453	**26.2**	**456**
437.leslie3d	48.8	193	**49.3**	**191**	49.8	189	48.8	193	**49.3**	**191**	49.8	189
444.namd	490	16.4	**490**	**16.4**	490	16.4	479	16.7	479	16.8	**479**	**16.8**
447.dealII	332	34.5	332	34.5	**332**	**34.5**	332	34.5	332	34.5	**332**	**34.5**
450.soplex	**311**	**26.9**	310	26.9	319	26.2	**311**	**26.9**	310	26.9	319	26.2
453.povray	166	32.0	**164**	**32.4**	164	32.4	**147**	**36.1**	147	36.2	147	36.1
454.calculix	264	31.3	**264**	**31.2**	265	31.2	268	30.8	268	30.7	**268**	**30.8**
459.GemsFDTD	**61.3**	**173**	61.3	173	64.0	166	55.3	192	**54.3**	**195**	53.8	197
465.tonto	378	26.0	377	26.1	**378**	**26.1**	370	26.6	**370**	**26.6**	370	26.6
470.lbm	25.8	533	24.3	566	**24.8**	**554**	25.8	533	24.3	566	**24.8**	**554**
481.wrf	186	60.2	**188**	**59.6**	190	58.8	186	60.2	**188**	**59.6**	190	58.8
482.sphinx3	538	36.2	**541**	**36.0**	542	35.9	538	36.2	**541**	**36.0**	542	35.9

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
     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 Jul 6 10:16:47 2017

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

Lenovo Global Technology

$SPECfp2006 = $ 69.5

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

$SPECfp_base2006 = $ 68.3

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

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

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) Bronze 3104 CPU @ 1.70GHz
      2 "physical id"s (chips)
      12 "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 : 6
      siblings  : 6
      physical 0: cores 0 1 2 3 4 5
      physical 1: cores 0 1 2 3 4 5
   cache size : 8448 KB

From /proc/meminfo
   MemTotal:       395886676 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.3 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.3"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

uname -a:
   Linux st550 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64
   x86_64 x86_64 GNU/Linux

run-level 3 Jul 5 18:35

SPEC is set to: /home/cpu2006-1.2-ic17.0
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda4       xfs   688G   25G  664G   4% /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 Lenovo -[O0E105R-1.00]- 04/27/2017
```

Lenovo Global Technology

$SPECfp2006 = $ 69.5

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

$SPECfp_base2006 = $ 68.3

CPU2006 license: 9017		**Test date:**	Jul-2017
Test sponsor: Lenovo Global Technology		**Hardware Availability:**	Aug-2017
Tested by: Lenovo Global Technology		**Software Availability:**	Nov-2016

Platform Notes (Continued)

```
   Memory:
    12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666 MHz, configured at 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"
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 = "12"

 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
     454.calculix: -DSPEC_CPU_LP64 -nofor_main
    459.GemsFDTD: -DSPEC_CPU_LP64
        465.tonto: -DSPEC_CPU_LP64
```

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

$\text{SPECfp2006} =$ 69.5

$\text{SPECfp\_base2006} =$ 68.3

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

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

Base Portability Flags (Continued)

```
       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
```

Continued on next page

Lenovo Global Technology

$SPECfp2006 = $ 69.5

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

$SPECfp_base2006 = $ 68.3

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

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

Peak Optimization Flags (Continued)

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

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

481.wrf: basepeak = yes

SPEC CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem ST550
(1.70 GHz, Intel Xeon Bronze 3104)

$SPECfp2006 = $ 69.5

$SPECfp_base2006 = $ 68.3

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.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.xml

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 Sep 20 11:03:54 2017 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 19 September 2017.