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

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

$SPECfp^®\_rate2006 = 538$

$SPECfp\_rate\_base2006 = 529$

CPU2006 license: 9017	**Test date:** Sep-2017
Test sponsor: Lenovo Global Technology	**Hardware Availability:** Aug-2017
Tested by: Lenovo Global Technology	**Software Availability:** Apr-2017

Copies

Benchmark	Copies	Value
410.bwaves	8	604
410.bwaves	16	614
416.gamess	16	458
416.gamess	16	444
433.milc	16	674
434.zeusmp	16	603
435.gromacs	16	581
435.gromacs	16	571
436.cactusADM	16	649
437.leslie3d	8	492
437.leslie3d	16	355
444.namd	16	357
444.namd	16	355
447.dealII	16	714
450.soplex	8	323
450.soplex	16	365
453.povray	16	736
453.povray	16	633
454.calculix	16	714
459.GemsFDTD	8	265
459.GemsFDTD	16	307
465.tonto	16	562
465.tonto	16	540
470.lbm	16	572
481.wrf	16	722
482.sphinx3	16	483

SPECfp_rate_base2006 = 529

SPECfp_rate2006 = 538

Hardware

CPU Name:	Intel Xeon Gold 5122
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, 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 (x86_64) Kernel 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:	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

$SPECfp_rate2006 = $ 538

ThinkSystem SR530
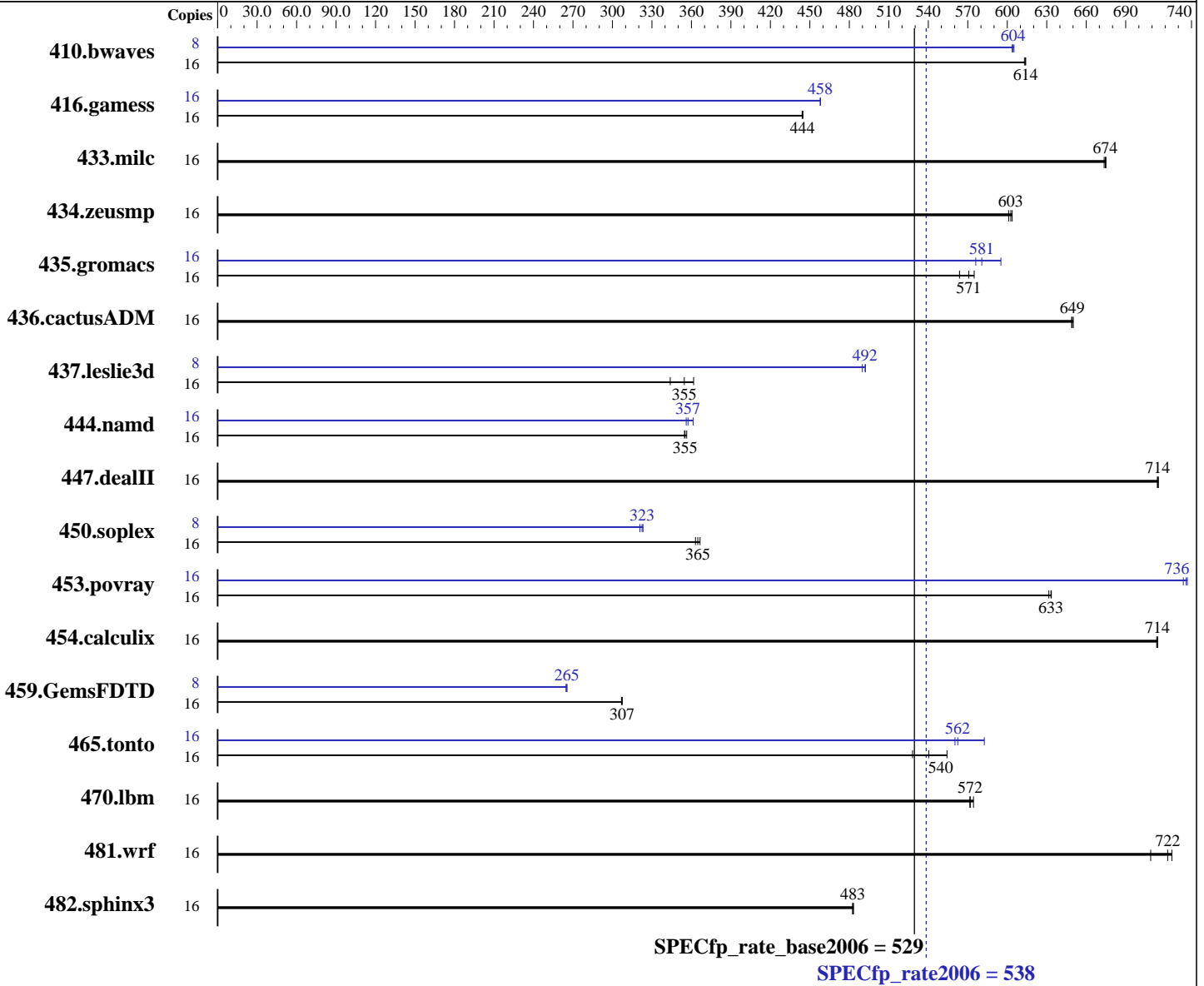(3.60 GHz, Intel Xeon Gold 5122)

$SPECfp_rate_base2006 = $ 529

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

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	354	614	**354**	**614**	355	613	8	180	605	180	604	**180**	**604**
416.gamess	16	704	445	**705**	**444**	705	444	16	**684**	**458**	684	458	684	458
433.milc	16	**218**	**674**	218	675	218	674	16	**218**	**674**	218	675	218	674
434.zeusmp	16	242	601	**242**	**603**	241	604	16	242	601	**242**	**603**	241	604
435.gromacs	16	**200**	**571**	199	575	203	564	16	**197**	**581**	198	576	192	595
436.cactusADM	16	294	650	**294**	**649**	295	649	16	294	650	**294**	**649**	295	649
437.leslie3d	16	437	344	416	362	**424**	**355**	8	**153**	**492**	153	492	154	490
444.namd	16	360	356	**361**	**355**	362	355	16	355	361	**359**	**357**	360	356
447.dealII	16	256	715	**256**	**714**	256	714	16	256	715	**256**	**714**	256	714
450.soplex	16	364	367	368	363	**366**	**365**	8	206	323	**207**	**323**	208	321
453.povray	16	**134**	**633**	135	632	134	634	16	**116**	**736**	116	737	116	734
454.calculix	16	185	714	**185**	**714**	185	714	16	185	714	**185**	**714**	185	714
459.GemsFDTD	16	**552**	**307**	552	307	553	307	8	321	265	**320**	**265**	320	265
465.tonto	16	284	554	**291**	**540**	298	528	16	**280**	**562**	270	583	281	560
470.lbm	16	383	574	385	572	**384**	**572**	16	383	574	385	572	**384**	**572**
481.wrf	16	246	725	**248**	**722**	252	709	16	246	725	**248**	**722**	252	709
482.sphinx3	16	645	483	**646**	**483**	646	483	16	645	483	**646**	**483**	646	483

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:
   Operating Mode set to Maximum Performance
   SNC set to Enable

Continued on next page

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

$SPECfp_rate2006 = $ 538

$SPECfp_rate_base2006 = $ 529

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

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

Platform Notes (Continued)

```
  DCU Streamer Prefetcher set to Disable
  XPT Prefetcher set to Disable
  LLC dead line alloc set to Disable
  Stale AtoS set to Enable
  Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
  Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
  running on linux-ickx Mon Sep  4 00:53:55 2017

  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 5122 CPU @ 3.60GHz
       2 "physical id"s (chips)
       16 "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  : 8
       physical 0: cores 1 5 9 13
       physical 1: cores 2 3 4 10
    cache size : 16896 KB

  From /proc/meminfo
    MemTotal:       395883268 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 linux-ickx 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 4 00:53
```

SPEC CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

$SPECfp_rate2006 = $ 538

$SPECfp_rate_base2006 = $ 529

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

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

Platform Notes (Continued)

```
  SPEC is set to: /home/cpu2006-1.2-ic17.0u3
     Filesystem      Type    Size   Used Avail Use% Mounted on
     /dev/sda2       btrfs  744G   134G  609G  19% /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 -[TEE105Z-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:
LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic17.0u3/lib/ia32:/home/cpu2006-1.2-ic17.0u3/lib/intel64:/home/cpu2006-1.2-ic17.0u3/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

SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

$SPECfp\_rate2006 =$ 538

$SPECfp\_rate\_base2006 =$ 529

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

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

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 -qopt-prefetch -auto-p32
    -qopt-mem-layout-trans=3
```

C++ benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
    -qopt-mem-layout-trans=3
```

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

Benchmarks using both Fortran and C:
```
    -xCORE-AVX2 -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
```

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

$SPECfp\_rate2006 =$ 538

$SPECfp\_rate\_base2006 =$ 529

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

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

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: -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
         -qopt-mem-layout-trans=3

447.dealII: basepeak = yes
```

Continued on next page

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

SPECfp_rate2006 =   538

SPECfp_rate_base2006 =   529

CPU2006 license: 9017

Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Sep-2017

Hardware Availability: Aug-2017

Software Availability: Apr-2017

Peak Optimization Flags (Continued)

450.soplex: -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) -qopt-malloc-options=3
-qopt-mem-layout-trans=3

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 -qopt-mem-layout-trans=3

Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

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) -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-AVX2(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/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-revF.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.xml

SPEC CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Gold 5122)

$\text{SPECfp\_rate2006} =$ 538

$\text{SPECfp\_rate\_base2006} =$ 529

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

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

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