SPEC® CFP2006 Result
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Lenovo Global Technology

$SPECfp^{®}2006 =$ 145

ThinkSystem SR950
(3.00 GHz, Intel Xeon Platinum 8158)

$SPECfp\_base2006 =$ 139

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

410.bwaves 2460
416.gamess 51.7 / 48.9
433.milc 69.0
434.zeusmp 125
435.gromacs 54.1
436.cactusADM 1250
437.leslie3d 245
444.namd 36.5 / 35.6
447.dealII 71.5
450.soplex 50.1
453.povray 79.2 / 69.9
454.calculix 75.9 / 72.6
459.GemsFDTD 115 / 98.5
465.tonto 66.5 / 48.1
470.lbm 5280
481.wrf 127
482.sphinx3 76.8

SPECfp_base2006 = 139
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Hardware

CPU Name:	Intel Xeon Platinum 8158
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	96 cores, 8 chips, 12 cores/chip
CPU(s) orderable:	2,4,8 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

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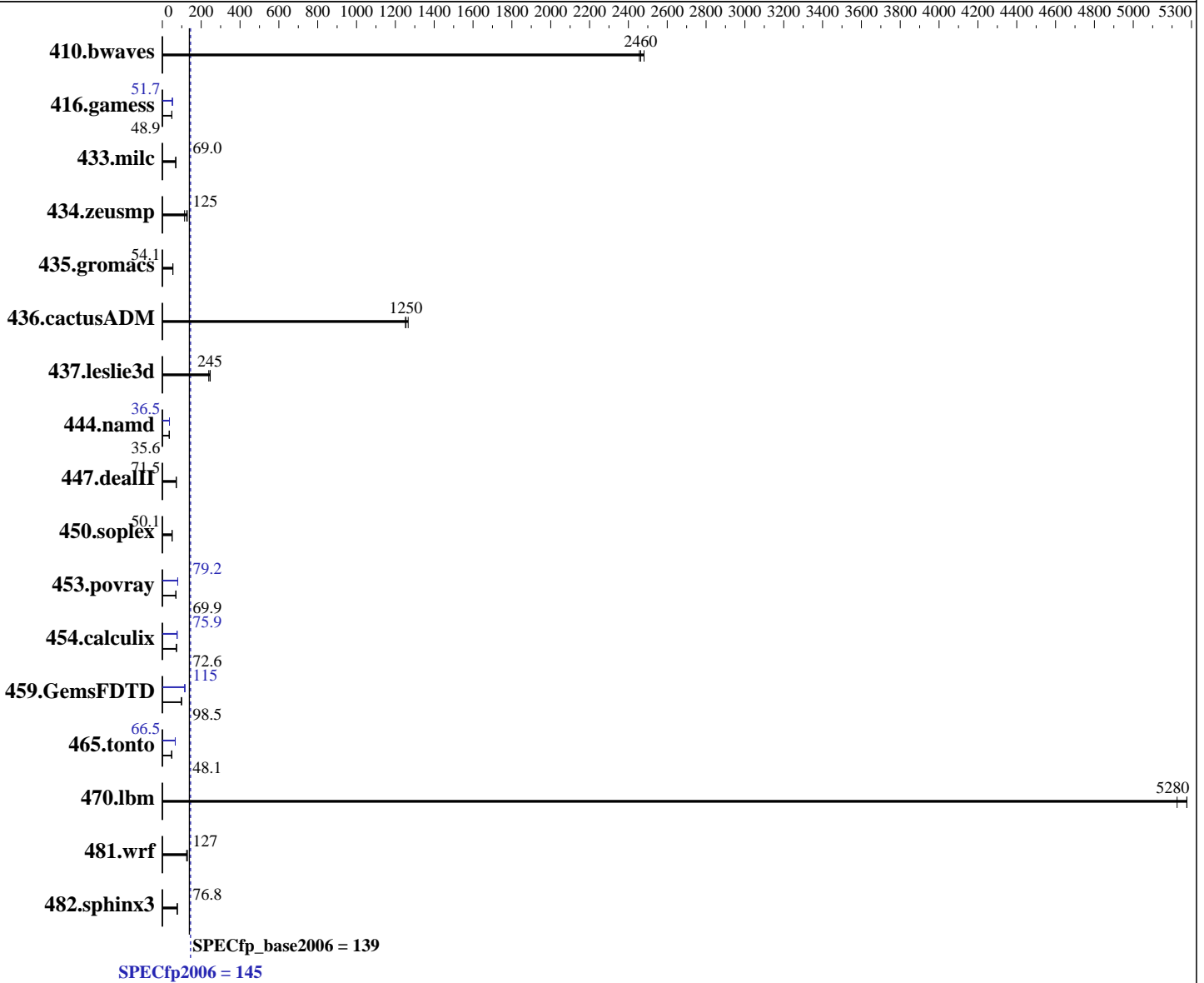
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L3 Cache: 24.75 MB I+D on chip per chip	Base Pointers: 64-bit
Other Cache: None	Peak Pointers: 32/64-bit
Memory: 3 TB (96 x 32 GB 2Rx4 PC4-2666V-R)	Other Software: None
Disk Subsystem: 1 x 800 GB SAS SSD	
Other Hardware: None	

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	5.53	2460	**5.52**	**2460**	5.48	2480	5.53	2460	**5.52**	**2460**	5.48	2480
416.gamess	400	48.9	401	48.9	**400**	**48.9**	379	51.7	378	51.7	**378**	**51.7**
433.milc	133	68.9	**133**	**69.0**	132	69.4	133	68.9	**133**	**69.0**	132	69.4
434.zeusmp	79.8	114	**73.0**	**125**	70.8	129	79.8	114	**73.0**	**125**	70.8	129
435.gromacs	132	54.0	**132**	**54.1**	132	54.1	132	54.0	**132**	**54.1**	132	54.1
436.cactusADM	9.55	1250	9.44	1270	**9.52**	**1250**	9.55	1250	9.44	1270	**9.52**	**1250**
437.leslie3d	39.4	239	**38.4**	**245**	38.1	247	39.4	239	**38.4**	**245**	38.1	247
444.namd	**225**	**35.6**	225	35.6	225	35.6	220	36.5	**220**	**36.5**	220	36.5
447.dealII	160	71.5	159	71.8	**160**	**71.5**	160	71.5	159	71.8	**160**	**71.5**
450.soplex	166	50.2	167	50.0	**166**	**50.1**	166	50.2	167	50.0	**166**	**50.1**
453.povray	**76.1**	**69.9**	76.5	69.5	76.1	69.9	67.3	79.0	**67.1**	**79.2**	67.1	79.3
454.calculix	114	72.7	**114**	**72.6**	114	72.5	109	75.9	**109**	**75.9**	109	75.6
459.GemsFDTD	107	99.1	109	97.4	**108**	**98.5**	91.3	116	92.2	115	**92.1**	**115**
465.tonto	202	48.8	206	47.7	**204**	**48.1**	**148**	**66.5**	148	66.5	148	66.4
470.lbm	2.60	5280	**2.60**	**5280**	2.63	5230	2.60	5280	**2.60**	**5280**	2.63	5230
481.wrf	86.8	129	**87.7**	**127**	89.4	125	86.8	129	**87.7**	**127**	89.4	125
482.sphinx3	253	77.0	255	76.5	**254**	**76.8**	253	77.0	255	76.5	**254**	**76.8**

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
    LLC dead line alloc set to Disable
     Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
     running on Proton8S-SUSE12SP2 Tue Aug 22 00:01:51 2017

     This section contains SUT (System Under Test) info as seen by
     some common utilities. To remove or add to this section, see:

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Test sponsor: Lenovo Global Technology		**Hardware Availability:**	Sep-2017
Tested by: Lenovo Global Technology		**Software Availability:**	Apr-2017

Platform Notes (Continued)

```
   http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8158 CPU @ 3.00GHz
      8 "physical id"s (chips)
      96 "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 : 12
      siblings  : 12
      physical 0: cores 0 1 2 3 4 9 10 16 18 19 25 26
      physical 1: cores 0 1 2 3 4 8 9 11 17 18 19 20
      physical 2: cores 0 1 2 3 4 8 9 11 17 18 19 20
      physical 3: cores 0 1 2 3 4 9 10 16 18 19 25 26
      physical 4: cores 0 1 2 3 10 17 18 19 24 25 26 27
      physical 5: cores 0 3 4 5 6 7 16 18 19 20 21 22
      physical 6: cores 0 1 2 3 4 9 10 16 18 19 25 26
      physical 7: cores 0 1 2 3 4 9 10 16 18 19 25 26
   cache size : 25344 KB

From /proc/meminfo
   MemTotal:       3170209980 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 Proton8S-SUSE12SP2 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 21 23:59

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
   Filesystem      Type    Size   Used Avail Use% Mounted on
   /dev/sdb3       btrfs   743G    62G  682G    9% /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 Lenovo -[PSE105L-1.00]- 06/22/2017
  Memory:
    96x Samsung M393A4K40BB2-CTD 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-ic17.0u3/lib/ia32:/home/cpu2006-1.2-ic17.0u3/lib/intel64:/home/cpu2006-1.2-ic17.0u3/sh10.2"
OMP_NUM_THREADS = "96"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.2
 Transparent Huge Pages disabled with:
  echo never > /sys/kernel/mm/transparent_hugepage/enabled
 Filesystem page cache cleared with:
 shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
```

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
```

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Hardware Availability: Sep-2017

Software Availability: Apr-2017

Base Portability Flags (Continued)

```
     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 -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
```

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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: -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

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Peak Optimization Flags (Continued)

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

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

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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