SPEC® CINT2006 Result
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Lenovo Global Technology

SPECint®_rate2006 =   581

ThinkSystem SN550
(3.60 GHz, Intel Xeon Platinum 8156)
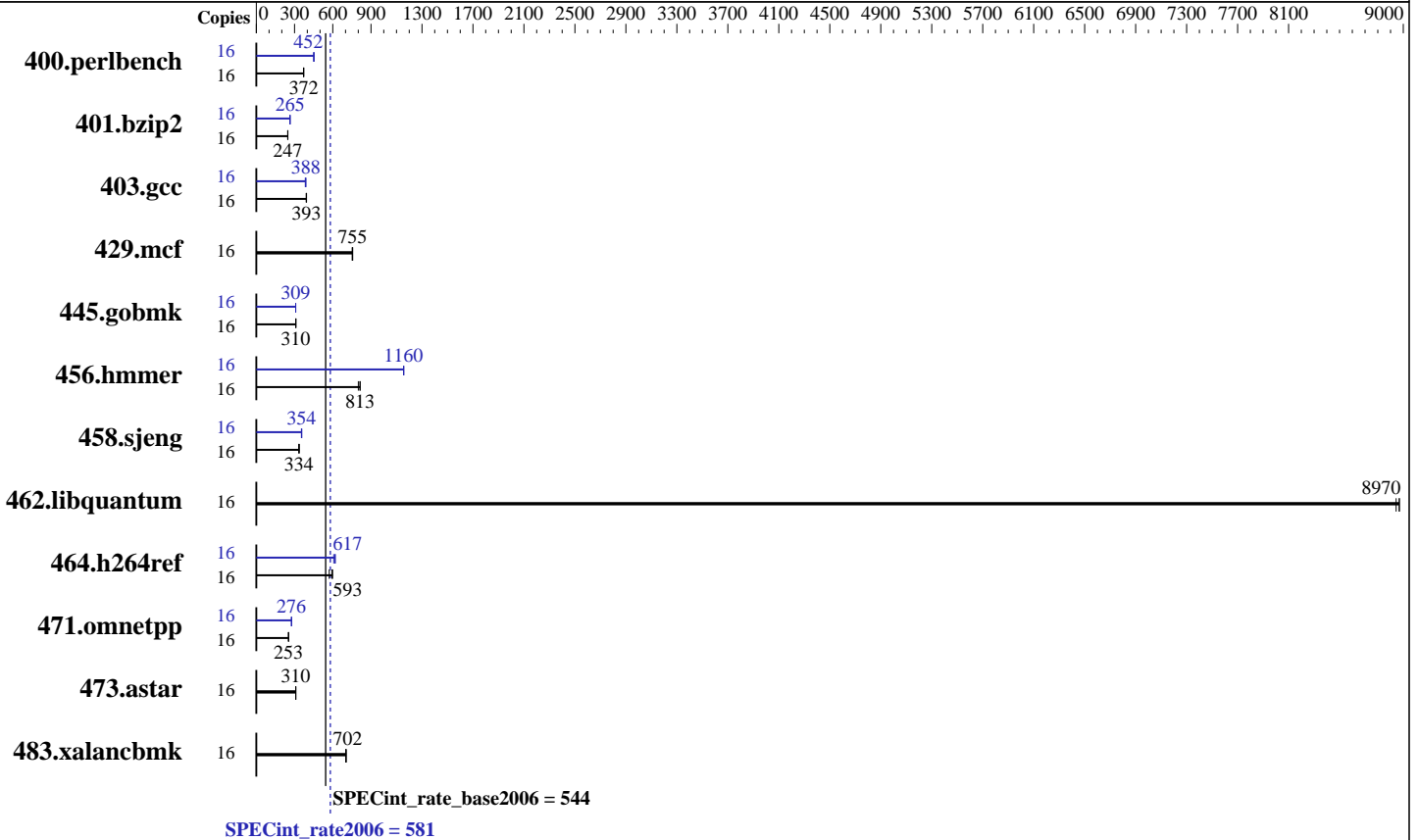
SPECint_rate_base2006 = 544

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

SPECint_rate_base2006 = 544

SPECint_rate2006 = 581

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, 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
L3 Cache:	16.5 MB I+D on chip per chip
Other Cache:	None
Memory:	768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)
Disk Subsystem:	1 x 800 GB SATA SSD
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 12 SP2 (x86_64) Kernel 4.4.21-69-default
Compiler:	C/C++: Version 17.0.1.132 of Intel C/C++ Compiler for Linux
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	16	420	372	**421**	**372**	422	370	16	**346**	**452**	345	453	347	450
401.bzip2	16	**624**	**247**	624	247	627	246	16	585	264	583	265	**583**	**265**
403.gcc	16	329	391	**328**	**393**	327	394	16	**332**	**388**	335	384	332	388
429.mcf	16	193	756	**193**	**755**	194	752	16	193	756	**193**	**755**	194	752
445.gobmk	16	**541**	**310**	542	310	541	310	16	**543**	**309**	544	309	543	309
456.hmmer	16	183	815	187	800	**184**	**813**	16	**129**	**1160**	129	1160	129	1160
458.sjeng	16	580	334	574	337	**580**	**334**	16	542	357	547	354	**546**	**354**
462.libquantum	16	**37.0**	**8970**	37.0	8970	37.1	8940	16	**37.0**	**8970**	37.0	8970	37.1	8940
464.h264ref	16	619	572	591	599	**597**	**593**	16	583	607	571	620	**574**	**617**
471.omnetpp	16	393	254	**395**	**253**	397	252	16	360	277	363	276	**363**	**276**
473.astar	16	363	309	**363**	**310**	363	310	16	363	309	**363**	**310**	363	310
483.xalancbmk	16	156	706	157	702	**157**	**702**	16	156	706	157	702	**157**	**702**

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:
     Choose Operating Mode set to Maximum Performance
     DCU Streamer Prefetcher set to Disable
     SNC set to Enable
     Per Core P-state set to Disable
     UPI Prefetcher set to Disable
     Stale AtoS set to Enable
     LLC dead line alloc set to Disable
    Sysinfo program /home/cpu2006-1.2-ic17.0u1/config/sysinfo.rev6993
    Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
    running on SN550 Thu Aug 31 11:17:19 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

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Platform Notes (Continued)

```
    model name : Intel(R) Xeon(R) Platinum 8156 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 0 3 10 13
       physical 1: cores 1 5 9 13
    cache size : 16896 KB

 From /proc/meminfo
    MemTotal:       792245164 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 SN550 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 31 11:14

 SPEC is set to: /home/cpu2006-1.2-ic17.0u1
    Filesystem     Type   Size   Used Avail Use% Mounted on
    /dev/sda4      xfs    687G    46G  642G    7% /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 -[IVE109A-1.00]- 04/27/2017
    Memory:
```

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Platform Notes (Continued)

```
    24x 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:
LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic17.0u1/lib/ia32:/home/cpu2006-1.2-ic17.0u1/lib/intel64:/home/cpu2006-1.2-ic17.0u1/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:
 echo 1>        /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

Base Compiler Invocation

C benchmarks:
```
    icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

Base Portability Flags

```
    400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
       401.bzip2: -D_FILE_OFFSET_BITS=64
         403.gcc: -D_FILE_OFFSET_BITS=64
         429.mcf: -D_FILE_OFFSET_BITS=64
       445.gobmk: -D_FILE_OFFSET_BITS=64
       456.hmmer: -D_FILE_OFFSET_BITS=64
       458.sjeng: -D_FILE_OFFSET_BITS=64
    462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
      464.h264ref: -D_FILE_OFFSET_BITS=64
      471.omnetpp: -D_FILE_OFFSET_BITS=64
        473.astar: -D_FILE_OFFSET_BITS=64
    483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

Base Optimization Flags

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

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Base Optimization Flags (Continued)

C++ benchmarks:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap
```

Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
`icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-DSPEC_CPU_LP64`
403.gcc: `-D_FILE_OFFSET_BITS=64`
429.mcf: `-D_FILE_OFFSET_BITS=64`
445.gobmk: `-D_FILE_OFFSET_BITS=64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
464.h264ref: `-D_FILE_OFFSET_BITS=64`
471.omnetpp: `-D_FILE_OFFSET_BITS=64`
473.astar: `-D_FILE_OFFSET_BITS=64`
483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

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Peak Optimization Flags

C benchmarks:

   400.perlbench: `-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) -auto-ilp32 -qopt-mem-layout-trans=3`

   401.bzip2: `-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-prefetch -auto-ilp32`
   `-qopt-mem-layout-trans=3`

   403.gcc: `-xCORE-AVX512 -ipo -O3 -no-prec-div`
   `-qopt-mem-layout-trans=3`

   429.mcf: basepeak = yes

   445.gobmk: `-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-mem-layout-trans=3`

   456.hmmer: `-xCORE-AVX512 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
   `-qopt-mem-layout-trans=3`

   458.sjeng: `-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-ilp32`
   `-qopt-mem-layout-trans=3`

   462.libquantum: basepeak = yes

   464.h264ref: `-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 -qopt-mem-layout-trans=3`

C++ benchmarks:

   471.omnetpp: `-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-ra-region-strategy=block`
   `-qopt-mem-layout-trans=3 -Wl,-z,muldefs`
   `-L/sh10.2 -lsmartheap`

   473.astar: basepeak = yes

   483.xalancbmk: basepeak = yes

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Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

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-revD.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-revD.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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