SPEC® CINT2006 Result

Lenovo Global Technology

ThinkSystem SR650
(3.20 GHz, Intel Xeon Gold 6134)

$SPECint^®\_rate2006 =$ 1110

$SPECint\_rate\_base2006 =$ 1040

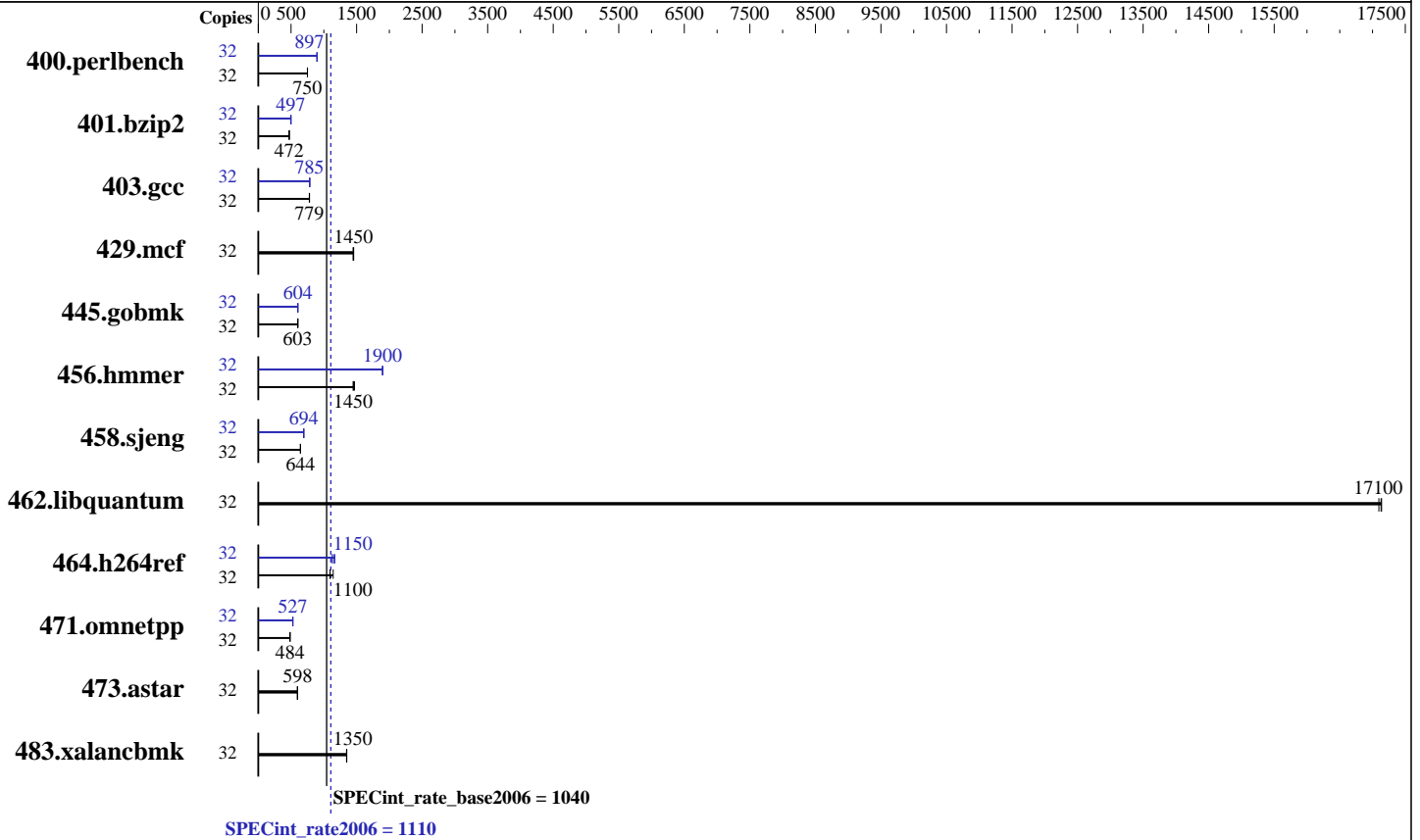|	
CPU2006 license: 9017	**Test date:** Aug-2017
Test sponsor: Lenovo Global Technology	**Hardware Availability:** Aug-2017
Tested by: Lenovo Global Technology	**Software Availability:** Apr-2017

Copies

Benchmark	Copies	Value
400.perlbench	32 / 32	897 / 750
401.bzip2	32 / 32	497 / 472
403.gcc	32 / 32	785 / 779
429.mcf	32	1450
445.gobmk	32 / 32	604 / 603
456.hmmer	32 / 32	1900 / 1450
458.sjeng	32 / 32	694 / 644
462.libquantum	32	17100
464.h264ref	32 / 32	1150 / 1100
471.omnetpp	32 / 32	527 / 484
473.astar	32	598
483.xalancbmk	32	1350

SPECint_rate_base2006 = 1040

SPECint_rate2006 = 1110

Hardware

CPU Name:	Intel Xeon Gold 6134
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3200
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 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:	24.75 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem:	1 x 800 GB SAS 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 17.0.3.191 of Intel C/C++ Compiler for Linux
Auto Parallel:	Yes
File System:	btrfs
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	32	417	749	416	751	**417**	**750**	32	**349**	**897**	349	897	349	895
401.bzip2	32	**655**	**472**	653	473	655	471	32	617	501	622	496	**622**	**497**
403.gcc	32	329	782	**331**	**779**	331	779	32	329	784	328	786	**328**	**785**
429.mcf	32	201	1450	202	1450	**201**	**1450**	32	201	1450	202	1450	**201**	**1450**
445.gobmk	32	558	602	556	604	**557**	**603**	32	**556**	**604**	557	602	556	604
456.hmmer	32	**206**	**1450**	203	1470	206	1450	32	157	1900	**157**	**1900**	158	1890
458.sjeng	32	**602**	**644**	602	643	602	644	32	**558**	**694**	559	693	557	695
462.libquantum	32	38.7	17100	**38.7**	**17100**	38.8	17100	32	38.7	17100	**38.7**	**17100**	38.8	17100
464.h264ref	32	620	1140	648	1090	**646**	**1100**	32	**616**	**1150**	628	1130	606	1170
471.omnetpp	32	413	484	414	484	**413**	**484**	32	**379**	**527**	379	528	379	527
473.astar	32	376	597	**376**	**598**	375	599	32	376	597	**376**	**598**	375	599
483.xalancbmk	32	164	1350	**164**	**1350**	163	1350	32	164	1350	**164**	**1350**	163	1350

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
    DCU Streamer Prefetcher set to Disable
    Stale AtoS set to Enable
    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 Cyborg-SPECcpu2017-SUSE12SP2 Sun Aug 12 07:21:52 2018

     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 6134 CPU @ 3.20GHz
          2 "physical id"s (chips)

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Platform Notes (Continued)

```
      32 "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 : 8
      siblings  : 16
      physical 0: cores 0 2 3 9 16 19 26 27
      physical 1: cores 0 4 5 6 16 19 20 22
   cache size : 25344 KB

From /proc/meminfo
   MemTotal:       395881260 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   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 Cyborg-SPECcpu2017-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 12 07:21

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/sdb2      btrfs  744G   92G  652G  13% /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 -[IVE111C-1.00]- 07/17/2017
   Memory:
   24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)
```

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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 -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
```

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

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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`

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`

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Peak Optimization Flags (Continued)

```
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
```

Peak Other Flags

C benchmarks:

```
403.gcc: -Dalloca=_alloca
```

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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

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