SPEC® CINT2006 Result

Lenovo Global Technology

SPECint®_rate2006 =   1020

ThinkSystem SR650
(2.40 GHz, Intel Xeon Gold 5115)

SPECint_rate_base2006 =   969

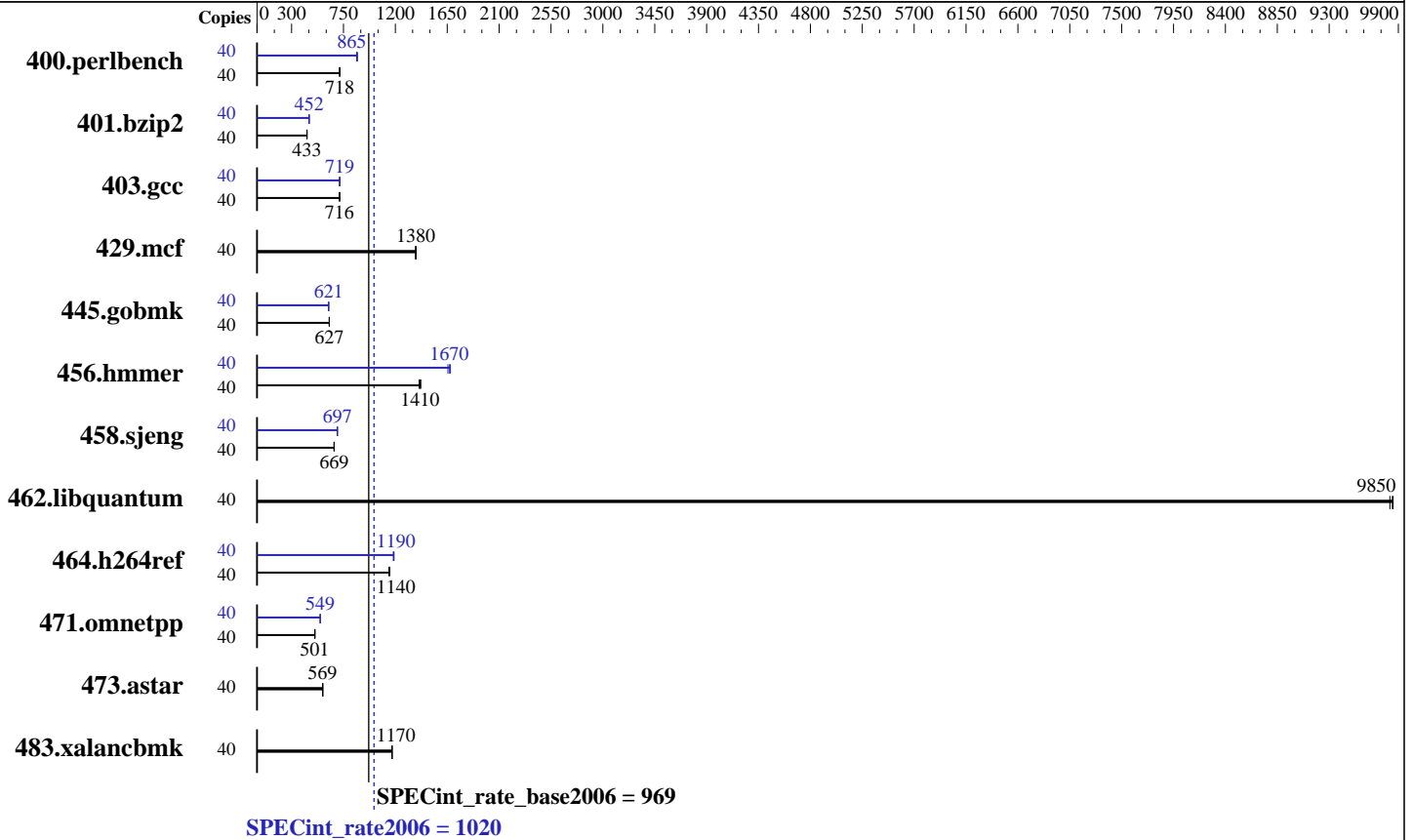**CPU2006 license:** 9017

Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Aug-2017

Hardware Availability: Aug-2017

Software Availability: Apr-2017

Copies 0 300   750   1200 1650 2100 2550 3000 3450 3900 4350 4800 5250 5700 6150 6600 7050 7500 7950 8400 8850 9300 9900

Benchmark	Copies	Value
400.perlbench	40 / 40	865 / 718
401.bzip2	40 / 40	452 / 433
403.gcc	40 / 40	719 / 716
429.mcf	40	1380
445.gobmk	40 / 40	621 / 627
456.hmmer	40 / 40	1670 / 1410
458.sjeng	40 / 40	697 / 669
462.libquantum	40	9850
464.h264ref	40 / 40	1190 / 1140
471.omnetpp	40 / 40	549 / 501
473.astar	40	569
483.xalancbmk	40	1170

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Hardware

CPU Name:	Intel Xeon Gold 5115
CPU Characteristics:	Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 10 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:	13.75 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400 MHz)
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:	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	40	543	719	**544**	**718**	547	715	40	452	864	448	872	**452**	**865**
401.bzip2	40	888	435	892	433	**891**	**433**	40	850	454	**855**	**452**	857	450
403.gcc	40	**450**	**716**	451	714	448	718	40	**448**	**719**	447	721	451	714
429.mcf	40	264	1380	**265**	**1380**	265	1370	40	264	1380	**265**	**1380**	265	1370
445.gobmk	40	669	627	670	626	**670**	**627**	40	675	622	675	621	**675**	**621**
456.hmmer	40	**264**	**1410**	265	1410	263	1420	40	222	1680	**223**	**1670**	225	1660
458.sjeng	40	724	669	723	669	**724**	**669**	40	694	698	695	696	**694**	**697**
462.libquantum	40	84.3	9830	**84.2**	**9850**	84.1	9850	40	84.3	9830	**84.2**	**9850**	84.1	9850
464.h264ref	40	768	1150	**773**	**1140**	773	1140	40	**746**	**1190**	749	1180	745	1190
471.omnetpp	40	**499**	**501**	497	503	500	500	40	456	549	**456**	**549**	456	548
473.astar	40	493	569	**493**	**569**	491	571	40	493	569	**493**	**569**	491	571
483.xalancbmk	40	236	1170	**236**	**1170**	235	1170	40	236	1170	**236**	**1170**	235	1170

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
   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-SUT3 Fri Aug 25 09:46:42 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 5115 CPU @ 2.40GHz
          2 "physical id"s (chips)
          40 "processors"
```

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Platform Notes (Continued)

```
   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 : 10
      siblings  : 20
      physical 0: cores 0 1 2 3 4 8 9 10 11 12
      physical 1: cores 0 1 2 3 4 8 9 10 11 12
   cache size : 14080 KB

From /proc/meminfo
   MemTotal:      395893692 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 Cyborg-SUT3 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 25 09:46

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sdb3      xfs   445G   11G  435G   3% /
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, configured at 2400 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-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
      -qopt-mem-layout-trans=3

C++ benchmarks:
      -xCORE-AVX2 -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-AVX2(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-AVX2(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-AVX2 -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-AVX2(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-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
              -qopt-mem-layout-trans=3
```

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

```
462.libquantum: basepeak = yes
```

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

C++ benchmarks:

```
   471.omnetpp: -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-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.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.xml

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

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