SPEC® CINT2006 Result

Lenovo Global Technology

ThinkSystem SR950
(3.00 GHz, Intel Xeon Platinum 8158)

$SPECint®2006 =$ 77.9

$SPECint\_base2006 =$ 74.2
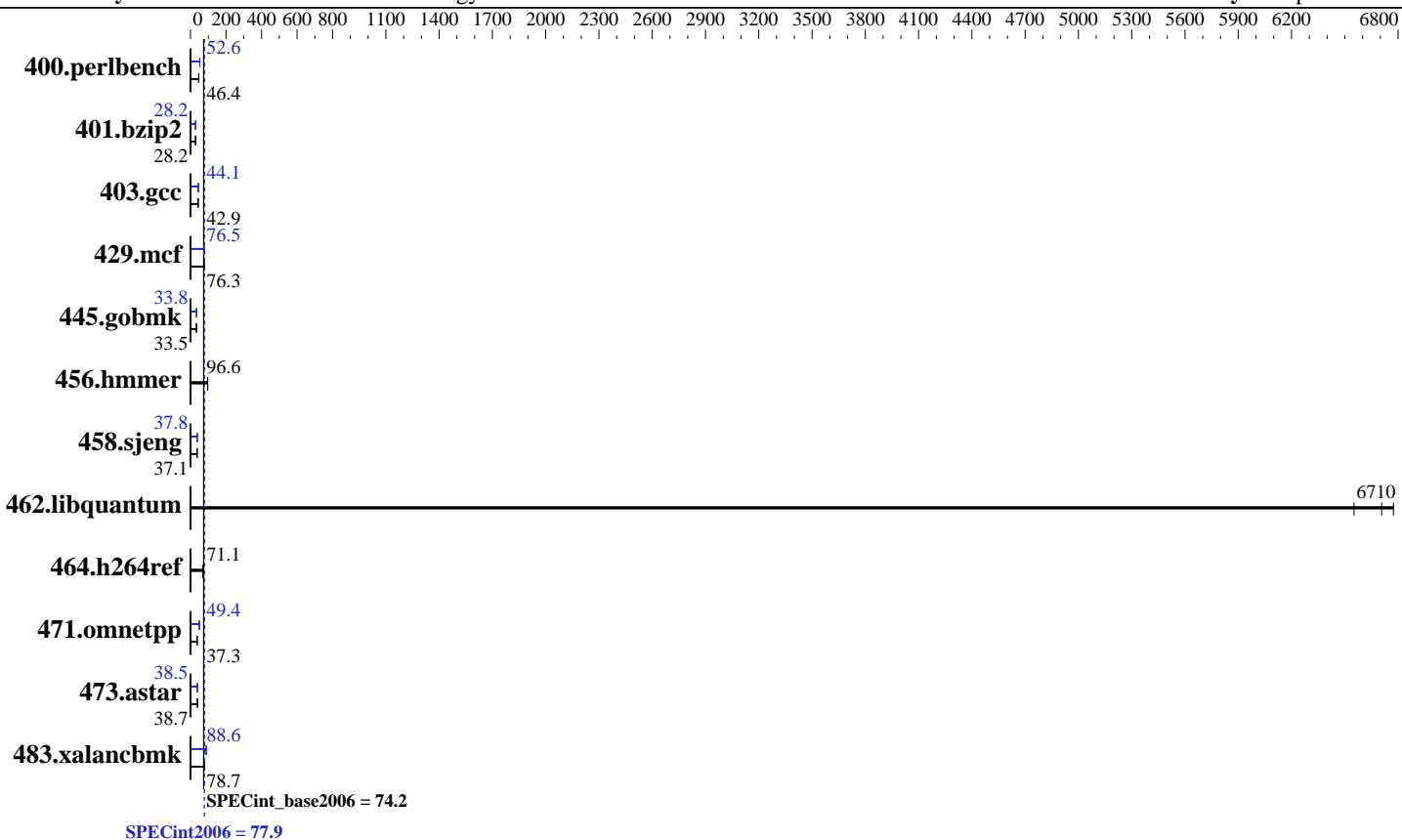
CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

400.perlbench	52.6 / 46.4
401.bzip2	28.2 / 28.2
403.gcc	44.1 / 42.9
429.mcf	76.5 / 76.3
445.gobmk	33.8 / 33.5
456.hmmer	96.6
458.sjeng	37.8 / 37.1
462.libquantum	6710
464.h264ref	71.1
471.omnetpp	49.4 / 37.3
473.astar	38.5 / 38.7
483.xalancbmk	88.6 / 78.7

SPECint_base2006 = 74.2

SPECint2006 = 77.9

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

Software

Operating System:	Red Hat Enterprise Linux Server release 7.3 (Maipo) Kernel 3.10.0-514.el7.x86_64
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:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	210	46.4	211	46.3	**211**	**46.4**	186	52.5	**186**	**52.6**	186	52.6
401.bzip2	341	28.3	**342**	**28.2**	343	28.2	341	28.3	342	28.2	**342**	**28.2**
403.gcc	188	42.8	**188**	**42.9**	188	42.9	**183**	**44.1**	183	44.1	183	44.0
429.mcf	**120**	**76.3**	117	77.7	120	76.0	**119**	**76.5**	118	77.0	122	74.9
445.gobmk	313	33.5	314	33.4	**313**	**33.5**	311	33.7	**311**	**33.8**	311	33.8
456.hmmer	96.7	96.4	96.5	96.7	**96.6**	**96.6**	96.7	96.4	96.5	96.7	**96.6**	**96.6**
458.sjeng	326	37.2	326	37.1	**326**	**37.1**	320	37.8	320	37.8	**320**	**37.8**
462.libquantum	3.16	6550	3.06	6770	**3.09**	**6710**	3.16	6550	3.06	6770	**3.09**	**6710**
464.h264ref	310	71.4	312	71.0	**311**	**71.1**	310	71.4	312	71.0	**311**	**71.1**
471.omnetpp	**167**	**37.3**	167	37.3	168	37.2	127	49.4	**127**	**49.4**	128	48.7
473.astar	183	38.4	181	38.8	**181**	**38.7**	**182**	**38.5**	183	38.5	182	38.6
483.xalancbmk	87.7	78.7	**87.6**	**78.7**	87.5	78.8	77.7	88.9	78.1	88.4	**77.9**	**88.6**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The config file option 'submit' was used.

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
    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 Proton8S-RHEL7.3 Mon Aug 21 18:58:10 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) 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
```

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Platform Notes (Continued)

```
     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:       3170214748 kB
     HugePages_Total:        0
     Hugepagesize:        2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.3 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VERSION_ID="7.3"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
        ANSI_COLOR="0;31"
        CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
     redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
     system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

  uname -a:
     Linux Proton8S-RHEL7.3 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT
     2016 x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Aug 21 18:56

  SPEC is set to: /home/cpu2006-1.2-ic17.0u3
     Filesystem     Type   Size  Used Avail Use% Mounted on
     /dev/sda3      xfs    743G   27G  717G   4% /
  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
```

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Platform Notes (Continued)

      (End of data from sysinfo program)

General Notes

    Environment variables set by runspec before the start of the run:
    KMP_AFFINITY = "granularity=fine,compact,0,3"
    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 enabled by default.
     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

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
      -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch
      -auto-p32

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Test sponsor: Lenovo Global Technology   **Hardware Availability:** Sep-2017
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Base Optimization Flags (Continued)

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh10.2 -lsmartheap64
```

Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m64`

400.perlbench: `icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

445.gobmk: `icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32`

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

473.astar: `icpc -m64`

Peak Portability Flags

400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32`
401.bzip2: `-DSPEC_CPU_LP64`
403.gcc: `-DSPEC_CPU_LP64`
429.mcf: `-DSPEC_CPU_LP64`
445.gobmk: `-D_FILE_OFFSET_BITS=64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
464.h264ref: `-DSPEC_CPU_LP64`
471.omnetpp: `-D_FILE_OFFSET_BITS=64`
473.astar: `-DSPEC_CPU_LP64`
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-AVX2(pass 2)
                   -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
                   -no-prec-div(pass 2) -qopt-prefetch

       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 -auto-ilp32 -qopt-prefetch

         403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
                   -qopt-malloc-options=3 -auto-ilp32

         429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
                   -qopt-prefetch -auto-p32

       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)

       456.hmmer: basepeak = yes

       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

   462.libquantum: basepeak = yes

      464.h264ref: basepeak = yes

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
                   -Wl,-z,muldefs -L/sh10.2 -lsmartheap

        473.astar: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
                   -auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64

    483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
                   -Wl,-z,muldefs -L/sh10.2 -lsmartheap

Peak Other Flags

C benchmarks:

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Peak Other Flags (Continued)

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-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.

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Oct 4 12:34:33 2017 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 3 October 2017.