SPEC® CINT2006 Result
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Lenovo Global Technology

ThinkSystem SR950
(2.00 GHz, Intel Xeon Platinum 8153)

$SPECint®2006 =$ 62.4

$SPECint\_base2006 =$ 59.9

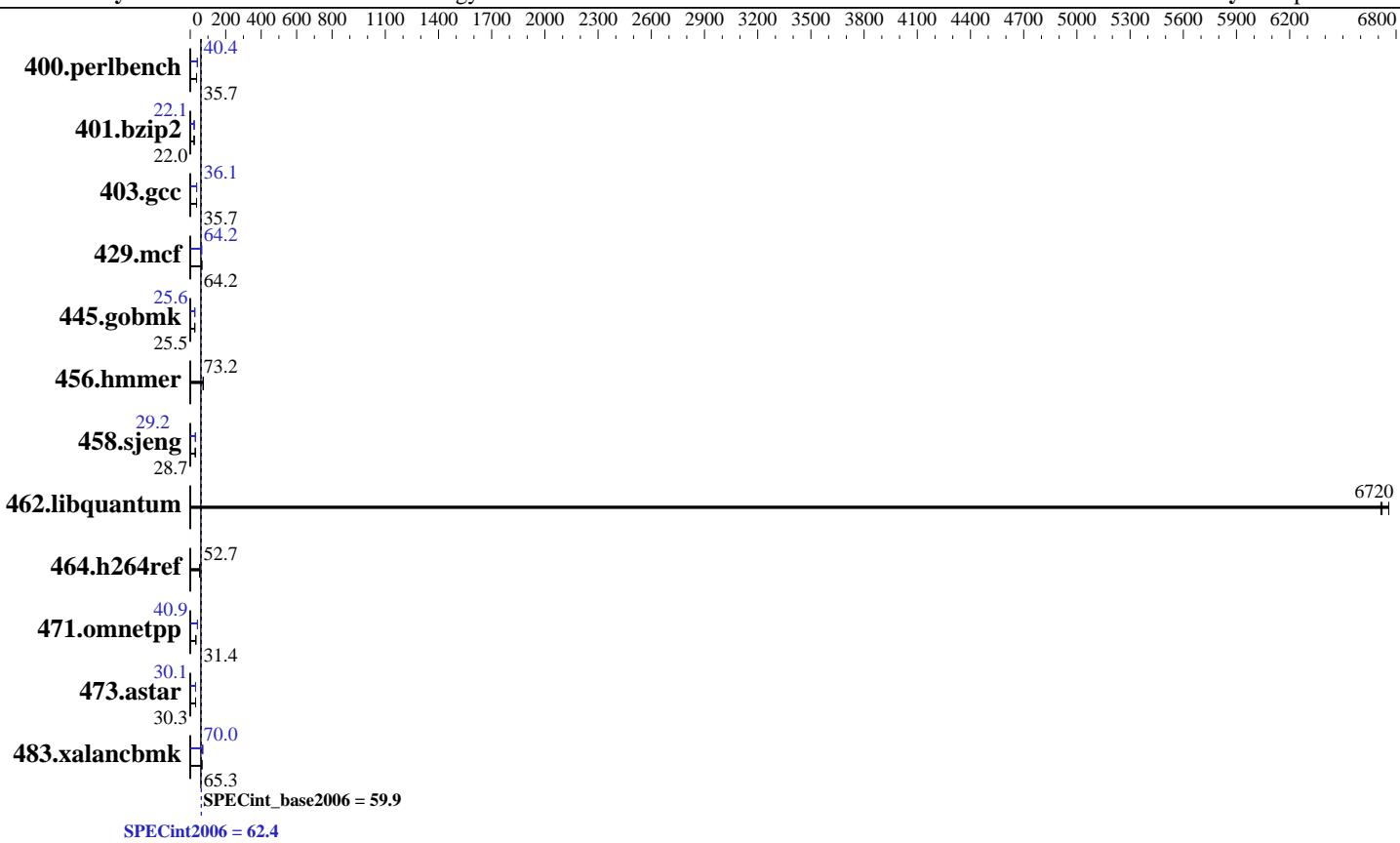**CPU2006 license:** 9017

Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Sep-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2017

Benchmark results (scale 0 to 6800):

- **400.perlbench** 40.4 / 35.7
- **401.bzip2** 22.1 / 22.0
- **403.gcc** 36.1 / 35.7
- **429.mcf** 64.2 / 64.2
- **445.gobmk** 25.6 / 25.5
- **456.hmmer** 73.2
- **458.sjeng** 29.2 / 28.7
- **462.libquantum** 6720
- **464.h264ref** 52.7
- **471.omnetpp** 40.9 / 31.4
- **473.astar** 30.1 / 30.3
- **483.xalancbmk** 70.0 / 65.3

SPECint_base2006 = 59.9

SPECint2006 = 62.4

Hardware

CPU Name:	Intel Xeon Platinum 8153
CPU Characteristics:	Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	128 cores, 8 chips, 16 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:	22 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	**274**	**35.7**	274	35.6	274	35.7	**242**	**40.4**	241	40.5	242	40.4
401.bzip2	**438**	**22.0**	437	22.1	439	22.0	436	22.2	**437**	**22.1**	438	22.0
403.gcc	**225**	**35.7**	225	35.7	226	35.7	**223**	**36.1**	223	36.2	223	36.1
429.mcf	138	66.1	142	64.2	**142**	**64.2**	141	64.8	144	63.5	**142**	**64.2**
445.gobmk	**411**	**25.5**	411	25.5	411	25.5	**409**	**25.6**	409	25.6	409	25.6
456.hmmer	127	73.2	127	73.3	**127**	**73.2**	127	73.2	127	73.3	**127**	**73.2**
458.sjeng	422	28.7	**421**	**28.7**	421	28.7	414	29.2	414	29.2	**414**	**29.2**
462.libquantum	3.07	6760	**3.08**	**6720**	3.09	6710	3.07	6760	**3.08**	**6720**	3.09	6710
464.h264ref	419	52.8	420	52.7	**420**	**52.7**	419	52.8	420	52.7	**420**	**52.7**
471.omnetpp	199	31.4	199	31.4	**199**	**31.4**	153	40.8	153	40.9	**153**	**40.9**
473.astar	233	30.2	232	30.3	**232**	**30.3**	**233**	**30.1**	234	30.0	233	30.1
483.xalancbmk	**106**	**65.3**	105	65.4	106	65.3	**98.5**	**70.0**	98.4	70.1	98.6	70.0

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 Sep  4 22:22:05 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 8153 CPU @ 2.00GHz
           8 "physical id"s (chips)
           128 "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 : 16
      siblings  : 16
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 4: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 5: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 6: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 7: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    cache size : 22528 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 Sep 4 22:20

  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 = "128"

   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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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.

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