



SPEC® CINT2006 Result

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Lenovo Global Technology

SPECint®2006 = 62.3

ThinkSystem SR650
(2.20 GHz, Intel Xeon Silver 4114)

SPECint_base2006 = 59.8

CPU2006 license: 9017

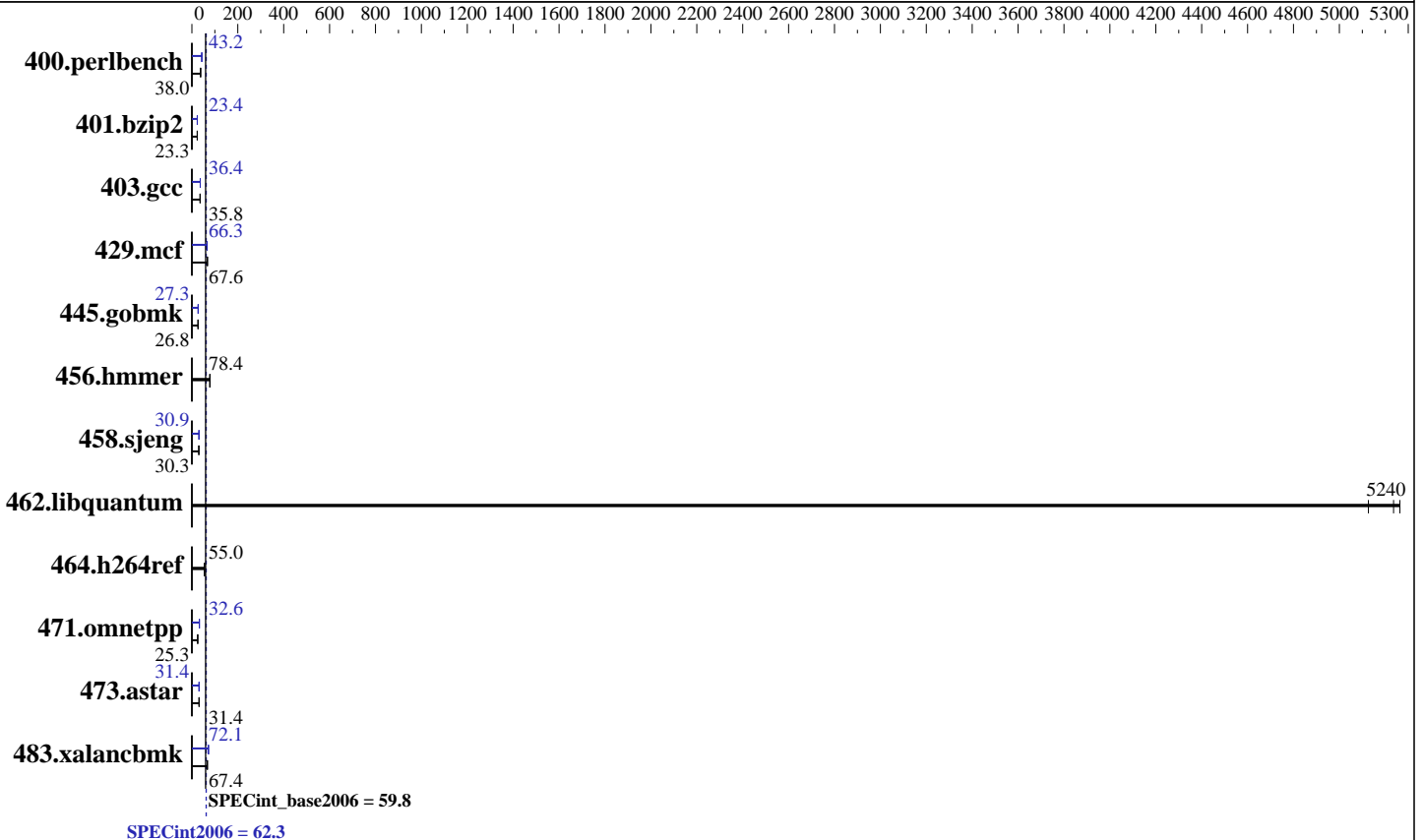
Test date: Aug-2017

Test sponsor: Lenovo Global Technology

Hardware Availability: Aug-2017

Tested by: Lenovo Global Technology

Software Availability: Apr-2017



Hardware

CPU Name: Intel Xeon Silver 4114
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
 CPU MHz: 2200
 FPU: Integrated
 CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip
 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: 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 | <u>257</u> | <u>38.0</u> | 257 | 38.0 | 257 | 38.0 | <u>226</u> | <u>43.2</u> | 226 | 43.2 | 227 | 43.1 |
| 401.bzip2 | 414 | 23.3 | <u>414</u> | <u>23.3</u> | 414 | 23.3 | <u>412</u> | <u>23.4</u> | 412 | 23.4 | 412 | 23.4 |
| 403.gcc | 225 | 35.8 | <u>225</u> | <u>35.8</u> | 225 | 35.8 | 221 | 36.3 | 221 | 36.4 | <u>221</u> | <u>36.4</u> |
| 429.mcf | 135 | 67.5 | 135 | 67.6 | <u>135</u> | <u>67.6</u> | 138 | 66.2 | 137 | 66.7 | <u>138</u> | <u>66.3</u> |
| 445.gobmk | 391 | 26.9 | <u>391</u> | <u>26.8</u> | 391 | 26.8 | <u>384</u> | <u>27.3</u> | 384 | 27.3 | 384 | 27.3 |
| 456.hammer | <u>119</u> | <u>78.4</u> | 119 | 78.5 | 119 | 78.4 | <u>119</u> | <u>78.4</u> | 119 | 78.5 | 119 | 78.4 |
| 458.sjeng | 399 | 30.3 | <u>399</u> | <u>30.3</u> | 399 | 30.3 | 392 | 30.9 | 392 | 30.9 | <u>392</u> | <u>30.9</u> |
| 462.libquantum | 3.94 | 5260 | 4.04 | 5130 | <u>3.96</u> | <u>5240</u> | 3.94 | 5260 | 4.04 | 5130 | <u>3.96</u> | <u>5240</u> |
| 464.h264ref | 401 | 55.1 | 403 | 55.0 | <u>402</u> | <u>55.0</u> | 401 | 55.1 | 403 | 55.0 | <u>402</u> | <u>55.0</u> |
| 471.omnetpp | <u>247</u> | <u>25.3</u> | 246 | 25.4 | 248 | 25.2 | 191 | 32.7 | <u>192</u> | <u>32.6</u> | 192 | 32.5 |
| 473.astar | 223 | 31.5 | 225 | 31.2 | <u>224</u> | <u>31.4</u> | <u>224</u> | <u>31.4</u> | 224 | 31.4 | 224 | 31.3 |
| 483.xalancbmk | 102 | 67.4 | 102 | 67.3 | <u>102</u> | <u>67.4</u> | <u>95.7</u> | <u>72.1</u> | 96.0 | 71.9 | 95.7 | 72.1 |

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 Disabled

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-RHEL7.3 Tue Aug 21 22:03:35 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) Silver 4114 CPU @ 2.20GHz

2 "physical id"s (chips)

20 "processors"

cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with

Continued on next page

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info@spec.org

<http://www.spec.org/>

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Platform Notes (Continued)

```

caution.)
  cpu cores : 10
  siblings  : 10
  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:      395885492 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 Cyborg-SPECcpu2017-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 22:03

```

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   744G  143G  602G  20% /

```

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:

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 = "20"

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.xalanbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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



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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.hmmmer: -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

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

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Peak Optimization Flags (Continued)

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.hmmr: 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:

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.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>



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For other inquiries, please contact webmaster@spec.org.

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