



# SPEC® CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECint®\_rate2006 = 1070

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

SPECint\_rate\_base2006 = 1020

CPU2006 license: 9017

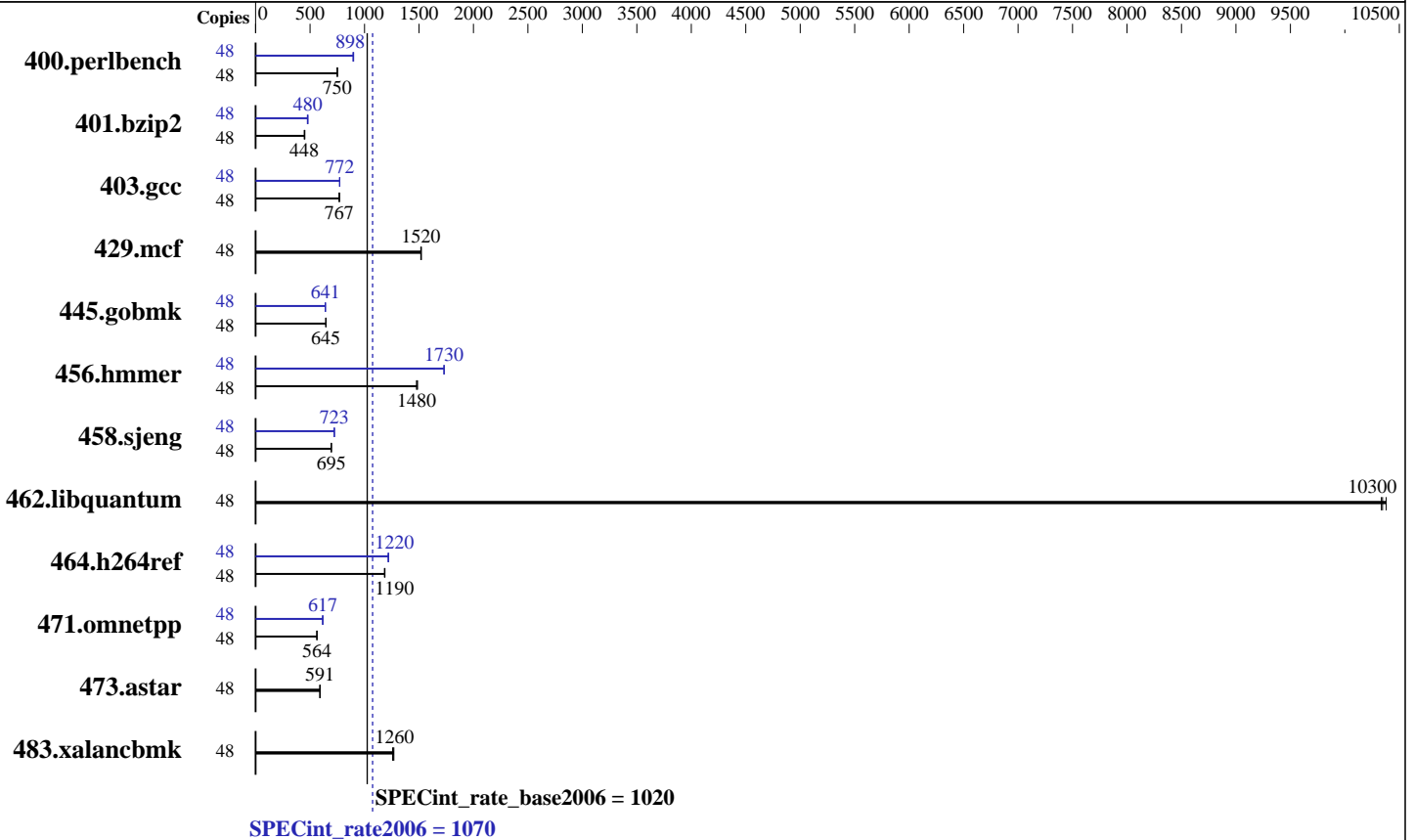
Test date: Nov-2017

Test sponsor: Lenovo Global Technology

Hardware Availability: Nov-2017

Tested by: Lenovo Global Technology

Software Availability: Aug-2017



### Hardware

CPU Name: Intel Xeon Silver 4116  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz  
 CPU MHz: 2100  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 2 chips, 12 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: 16.5 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)  
 Disk Subsystem: 1 x 800 GB SAS SSD  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 7.4 (Maipo)  
 Kernel 3.10.0-693.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-bit  
 Peak Pointers: 32/64-bit  
 Other Software: Microquill SmartHeap V10.2



# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECint\_rate2006 = 1070

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

SPECint\_rate\_base2006 = 1020

CPU2006 license: 9017

Test date: Nov-2017

Test sponsor: Lenovo Global Technology

Hardware Availability: Nov-2017

Tested by: Lenovo Global Technology

Software Availability: Aug-2017

## Results Table

| Benchmark      | Base   |            |             |             |            |             |              | Peak   |            |             |            |             |             |              |
|----------------|--------|------------|-------------|-------------|------------|-------------|--------------|--------|------------|-------------|------------|-------------|-------------|--------------|
|                | Copies | Seconds    | Ratio       | Seconds     | Ratio      | Seconds     | Ratio        | Copies | Seconds    | Ratio       | Seconds    | Ratio       | Seconds     | Ratio        |
| 400.perlbench  | 48     | 624        | 751         | 625         | 750        | <u>625</u>  | <u>750</u>   | 48     | <u>522</u> | <u>898</u>  | 521        | 900         | 525         | 894          |
| 401.bzip2      | 48     | 1024       | 452         | <u>1033</u> | <u>448</u> | 1035        | 447          | 48     | 965        | 480         | 975        | 475         | <u>966</u>  | <u>480</u>   |
| 403.gcc        | 48     | 504        | 767         | <u>503</u>  | <u>767</u> | 501         | 771          | 48     | 501        | 771         | 500        | 772         | <u>500</u>  | <u>772</u>   |
| 429.mcf        | 48     | 289        | 1520        | 288         | 1520       | <u>288</u>  | <u>1520</u>  | 48     | 289        | 1520        | 288        | 1520        | <u>288</u>  | <u>1520</u>  |
| 445.gobmk      | 48     | 780        | 645         | 780         | 646        | <u>780</u>  | <u>645</u>   | 48     | 786        | 641         | 786        | 640         | <u>786</u>  | <u>641</u>   |
| 456.hammer     | 48     | <u>303</u> | <u>1480</u> | 303         | 1480       | 301         | 1490         | 48     | 259        | 1730        | <u>259</u> | <u>1730</u> | 259         | 1730         |
| 458.sjeng      | 48     | 835        | 696         | 836         | 695        | <u>835</u>  | <u>695</u>   | 48     | <u>804</u> | <u>723</u>  | 803        | 723         | 804         | 722          |
| 462.libquantum | 48     | 95.8       | 10400       | 96.2        | 10300      | <u>96.1</u> | <u>10300</u> | 48     | 95.8       | 10400       | 96.2       | 10300       | <u>96.1</u> | <u>10300</u> |
| 464.h264ref    | 48     | 898        | 1180        | 894         | 1190       | <u>895</u>  | <u>1190</u>  | 48     | 870        | 1220        | <u>871</u> | <u>1220</u> | 873         | 1220         |
| 471.omnetpp    | 48     | <u>532</u> | <u>564</u>  | 534         | 562        | 532         | 564          | 48     | 488        | 615         | 486        | 618         | <u>486</u>  | <u>617</u>   |
| 473.astar      | 48     | 571        | 590         | 569         | 592        | <u>570</u>  | <u>591</u>   | 48     | 571        | 590         | 569        | 592         | <u>570</u>  | <u>591</u>   |
| 483.xalancbmk  | 48     | <u>262</u> | <u>1260</u> | 261         | 1270       | 263         | 1260         | 48     | <u>262</u> | <u>1260</u> | 261        | 1270        | 263         | 1260         |

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"  
echo 0 > /proc/sys/kernel/numa\_balancing

## Platform Notes

BIOS configuration:  
Choose Operating Mode set to Maximum Performance  
DCU Streamer Prefetcher set to Disable  
MONITORMWAIT set to Enable  
SNC set to Enable  
XPT Prefetcher set to Enable  
LLC Deadline Alloc set to Disable  
Patrol Scrub set to Disable  
Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on sr590-2 Tue Nov 21 21:21:34 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>

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Global Technology

**SPECint\_rate2006 = 1070**

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

**SPECint\_rate\_base2006 = 1020**

**CPU2006 license:** 9017

**Test date:** Nov-2017

**Test sponsor:** Lenovo Global Technology

**Hardware Availability:** Nov-2017

**Tested by:** Lenovo Global Technology

**Software Availability:** Aug-2017

### Platform Notes (Continued)

From /proc/cpuinfo

```

model name      : Intel(R) Xeon(R) Silver 4116 CPU @ 2.10GHz
 2 "physical id"s (chips)
 48 "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     : 12
  siblings      : 24
  physical 0    : cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 1    : cores 0 1 2 3 4 5 8 9 10 11 12 13
cache size      : 16896 KB

```

From /proc/meminfo

```

MemTotal:      395754444 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

From /etc/\*release\* /etc/\*version\*

```

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

```

uname -a:

```

Linux sr590-2 3.10.0-693.el7.x86_64 #1 SMP Thu Jul 6 19:56:57 EDT 2017 x86_64
x86_64 x86_64 GNU/Linux

```

run-level 3 Nov 21 21:19

SPEC is set to: /home/cpu2006-1.2-ic17.0u3

```

Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda2        xfs       690G      34G  656G   5% /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 -[TEE119J-1.20]- 09/06/2017

Memory:

```

12x Hynix HMA84GR7AFR4N-VK 32 GB 2 rank 2666 MHz, configured at 2400 MHz
4x NO DIMM NO DIMM

```

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECint\_rate2006 = 1070

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

SPECint\_rate\_base2006 = 1020

CPU2006 license: 9017

Test date: Nov-2017

Test sponsor: Lenovo Global Technology

Hardware Availability: Nov-2017

Tested by: Lenovo Global Technology

Software Availability: Aug-2017

## Platform Notes (Continued)

(End of data from sysinfo program)

## 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

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECint\_rate2006 = 1070

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

SPECint\_rate\_base2006 = 1020

CPU2006 license: 9017

Test date: Nov-2017

Test sponsor: Lenovo Global Technology

Hardware Availability: Nov-2017

Tested by: Lenovo Global Technology

Software Availability: Aug-2017

## Base Optimization Flags (Continued)

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap

## 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



# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECint\_rate2006 = 1070

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

SPECint\_rate\_base2006 = 1020

CPU2006 license: 9017

Test date: Nov-2017

Test sponsor: Lenovo Global Technology

Hardware Availability: Nov-2017

Tested by: Lenovo Global Technology

Software Availability: Aug-2017

## 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

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



# SPEC CINT2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

**Lenovo Global Technology**

ThinkSystem SR590  
(2.10 GHz, Intel Xeon Silver 4116)

**SPECint\_rate2006 = 1070**

**SPECint\_rate\_base2006 = 1020**

**CPU2006 license:** 9017

**Test sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**Test date:** Nov-2017

**Hardware Availability:** Nov-2017

**Software Availability:** Aug-2017

## 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-E.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-E.xml>

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Fri Dec 15 12:20:38 2017 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 15 December 2017.