



# SPEC® CINT2006 Result

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## Lenovo Group Limited

**SPECint®2006 = 58.7**

Lenovo ThinkServer SD350  
(2.60 GHz, Intel Xeon E5-2623 v4)

**SPECint\_base2006 = 56.2**

CPU2006 license: 9017

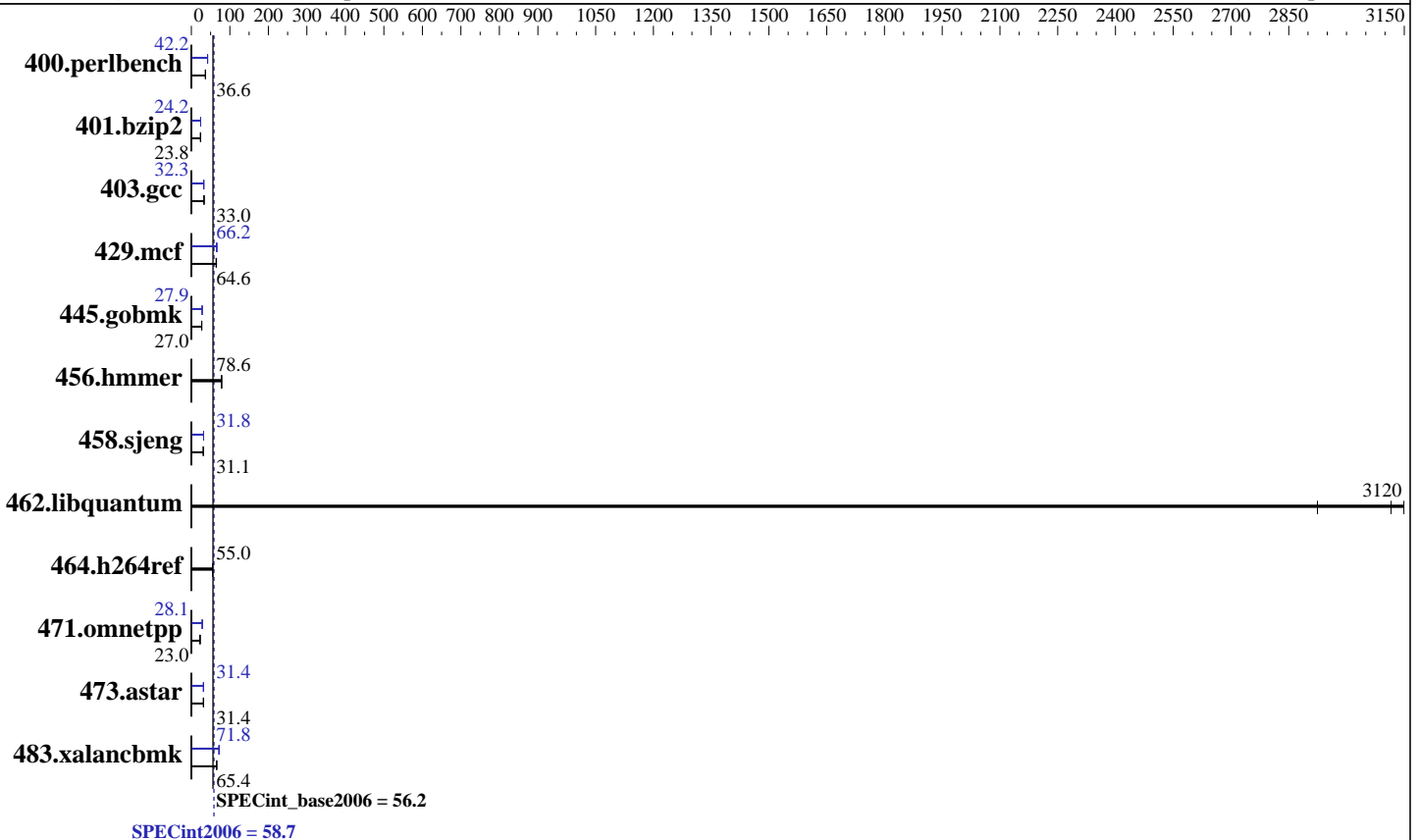
Test date: Jan-2017

Test sponsor: Lenovo Group Limited

Hardware Availability: Sep-2016

Tested by: Lenovo Group Limited

Software Availability: Sep-2016



### Hardware

CPU Name: Intel Xeon E5-2623 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 10 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)  
 Disk Subsystem: 1 x 800 GB SATA SSD  
 Other Hardware: None

### Software

Operating System: SUSE Linux Enterprise Server 12 SP1 (x86\_64)  
 Kernel 3.12.49-11-default  
 Compiler: C/C++: Version 17.0.0.098 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  | 267        | 36.7        | <b>267</b> | <b>36.6</b> | 268         | 36.5        | 231         | 42.3        | <b>231</b>  | <b>42.2</b> | 232         | 42.1        |
| 401.bzip2      | <b>405</b> | <b>23.8</b> | 406        | 23.8        | 403         | 23.9        | <b>399</b>  | <b>24.2</b> | 399         | 24.2        | 399         | 24.2        |
| 403.gcc        | <b>244</b> | <b>33.0</b> | 244        | 33.0        | 244         | 33.0        | 248         | 32.5        | 251         | 32.1        | <b>249</b>  | <b>32.3</b> |
| 429.mcf        | <b>141</b> | <b>64.6</b> | 142        | 64.3        | 140         | 65.3        | 137         | 66.4        | 139         | 65.5        | <b>138</b>  | <b>66.2</b> |
| 445.gobmk      | 388        | 27.0        | <b>389</b> | <b>27.0</b> | 390         | 26.9        | 376         | 27.9        | 374         | 28.1        | <b>376</b>  | <b>27.9</b> |
| 456.hammer     | 118        | 78.7        | 119        | 78.5        | <b>119</b>  | <b>78.6</b> | 118         | 78.7        | 119         | 78.5        | <b>119</b>  | <b>78.6</b> |
| 458.sjeng      | 390        | 31.1        | <b>390</b> | <b>31.1</b> | 390         | 31.0        | 380         | 31.8        | <b>380</b>  | <b>31.8</b> | 381         | 31.8        |
| 462.libquantum | 6.58       | 3150        | 7.09       | 2920        | <b>6.65</b> | <b>3120</b> | 6.58        | 3150        | 7.09        | 2920        | <b>6.65</b> | <b>3120</b> |
| 464.h264ref    | 403        | 54.9        | <b>402</b> | <b>55.0</b> | 402         | 55.1        | 403         | 54.9        | <b>402</b>  | <b>55.0</b> | 402         | 55.1        |
| 471.omnetpp    | <b>272</b> | <b>23.0</b> | 292        | 21.4        | 271         | 23.1        | <b>223</b>  | <b>28.1</b> | <b>222</b>  | <b>28.1</b> | 218         | 28.7        |
| 473.astar      | 224        | 31.4        | <b>223</b> | <b>31.4</b> | 222         | 31.6        | <b>223</b>  | <b>31.4</b> | 223         | 31.5        | 223         | 31.4        |
| 483.xalancbmk  | <b>105</b> | <b>65.4</b> | 106        | 65.4        | 104         | 66.4        | <b>95.8</b> | <b>72.0</b> | <b>96.1</b> | <b>71.8</b> | 96.1        | 71.8        |

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"  
Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## Platform Notes

BIOS configuration:  
Hyper-Threading set to Disabled  
Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on Kent-SUT4 Fri Jan 15 19:29:21 2016

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) CPU E5-2623 v4@ 2.60GHz  
2 "physical id"s (chips)  
8 "processors"  
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

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### Platform Notes (Continued)

```
cpu cores : 4
siblings  : 4
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB
```

From /proc/meminfo

```
MemTotal:      264573176 kB
HugePages_Total: 0
Hugepagesize:   2048 kB
```

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

SuSE-release:

SUSE Linux Enterprise Server 12 (x86\_64)

VERSION = 12

PATCHLEVEL = 1

# 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-SP1"

VERSION\_ID="12.1"

PRETTY\_NAME="SUSE Linux Enterprise Server 12 SP1"

ID="sles"

ANSI\_COLOR="0;32"

CPE\_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:

```
Linux Kent-SUT4 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Jan 15 19:28

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

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdc5       xfs   703G  4.6G  698G   1% /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 American Megatrends Inc. 3.57 08/12/2016

Memory:

16x Samsung M393A2G40DB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 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"

LD\_LIBRARY\_PATH = "/home/cpu2006-1.2-ic17.0/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2"

OMP\_NUM\_THREADS = "8"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM  
memory using Redhat Enterprise Linux 7.2

## 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.hmmmer: -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

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32  
-Wl,-z,muldefs -L/sh10.2 -lsmarthep64



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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.hmmcr: 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.html>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.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.xml>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.xml>



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