



# SPEC® CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

**SPECint®2006 = 71.1**

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

**SPECint\_base2006 = 69.4**

**CPU2006 license:** 9017

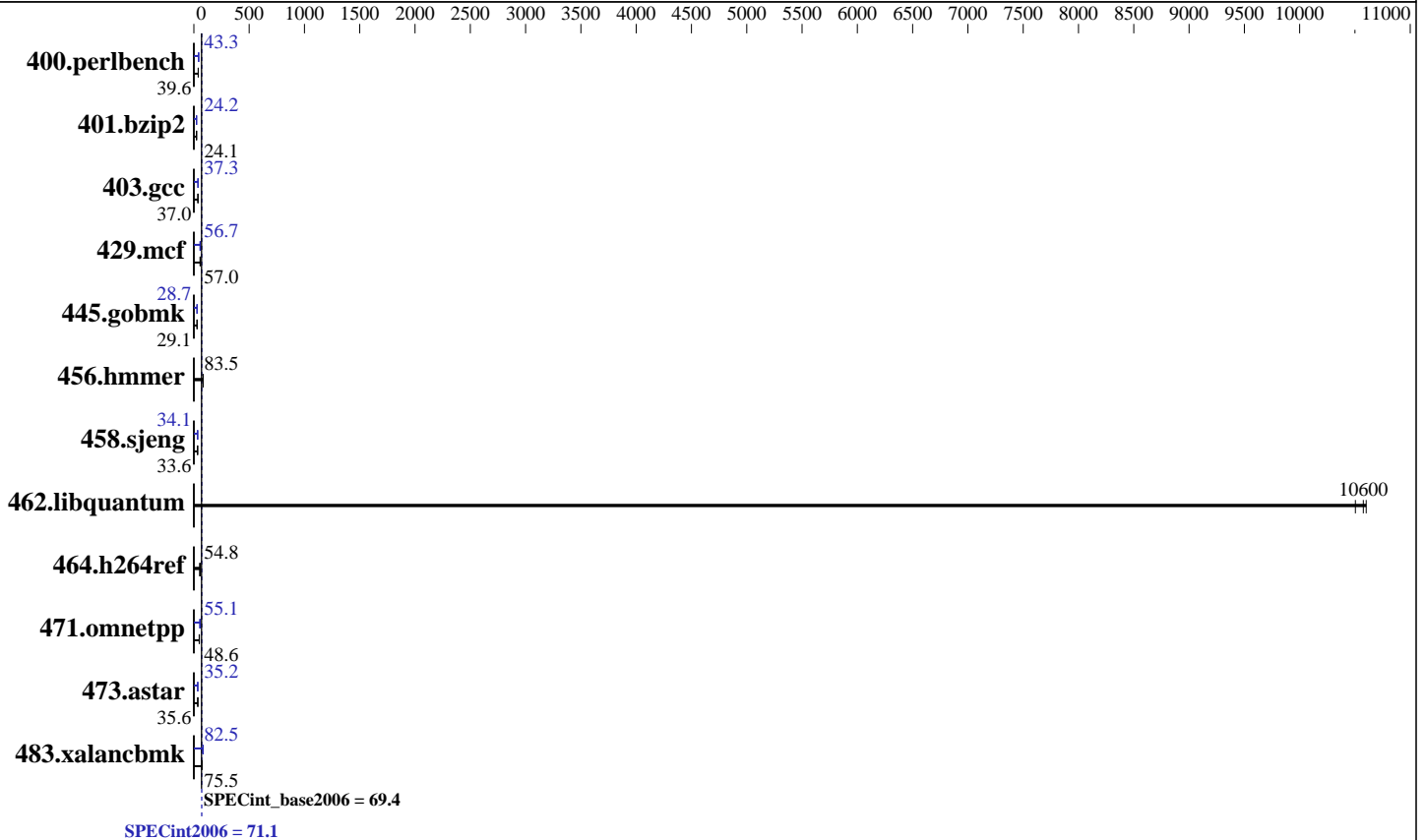
**Test date:** Jul-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Jul-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015



### Hardware

**CPU Name:** Intel Xeon E7-8890 v4  
**CPU Characteristics:** Intel Turbo Boost Technology up to 3.40 GHz  
**CPU MHz:** 2200  
**FPU:** Integrated  
**CPU(s) enabled:** 96 cores, 4 chips, 24 cores/chip  
**CPU(s) orderable:** 2,4 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:** 60 MB I+D on chip per chip  
**Other Cache:** None  
**Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-2133P-R, running at 1600 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 16.0.0.101 of Intel C++ Studio XE 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



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint2006 = **71.1**

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

SPECint\_base2006 = **69.4**

CPU2006 license: 9017

Test date: Jul-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jul-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	247	39.6	248	39.4	<b><u>247</u></b>	<b><u>39.6</u></b>	226	43.3	226	43.3	<b><u>226</u></b>	<b><u>43.3</u></b>
401.bzip2	399	24.2	403	24.0	<b><u>400</u></b>	<b><u>24.1</u></b>	398	24.2	<b><u>399</u></b>	<b><u>24.2</u></b>	399	24.2
403.gcc	<b><u>218</u></b>	<b><u>37.0</u></b>	217	37.1	218	37.0	217	37.0	<b><u>216</u></b>	<b><u>37.3</u></b>	216	37.3
429.mcf	160	57.0	<b><u>160</u></b>	<b><u>57.0</u></b>	160	56.9	161	56.7	<b><u>161</u></b>	<b><u>56.7</u></b>	161	56.6
445.gobmk	361	29.0	360	29.1	<b><u>361</u></b>	<b><u>29.1</u></b>	364	28.8	<b><u>365</u></b>	<b><u>28.7</u></b>	365	28.7
456.hammer	<b><u>112</u></b>	<b><u>83.5</u></b>	112	83.4	112	83.5	<b><u>112</u></b>	<b><u>83.5</u></b>	112	83.4	112	83.5
458.sjeng	<b><u>360</u></b>	<b><u>33.6</u></b>	360	33.6	360	33.6	355	34.1	<b><u>355</u></b>	<b><u>34.1</u></b>	355	34.1
462.libquantum	1.95	10600	1.97	10500	<b><u>1.96</u></b>	<b><u>10600</u></b>	1.95	10600	1.97	10500	<b><u>1.96</u></b>	<b><u>10600</u></b>
464.h264ref	405	54.6	<b><u>404</u></b>	<b><u>54.8</u></b>	404	54.8	405	54.6	<b><u>404</u></b>	<b><u>54.8</u></b>	404	54.8
471.omnetpp	124	50.2	<b><u>129</u></b>	<b><u>48.6</u></b>	129	48.3	113	55.1	113	55.1	<b><u>113</u></b>	<b><u>55.1</u></b>
473.astar	198	35.4	197	35.7	<b><u>197</u></b>	<b><u>35.6</u></b>	<b><u>200</u></b>	<b><u>35.2</u></b>	200	35.0	199	35.2
483.xalancbmk	91.4	75.5	<b><u>91.4</u></b>	<b><u>75.5</u></b>	91.2	75.6	<b><u>83.6</u></b>	<b><u>82.5</u></b>	83.4	82.7	83.6	82.5

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:

Operating Mode set to "Maximum Performance"

Hyper-Threading set to Disable

Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1

running on Draco-02 Mon Jul 11 10:11:26 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 E7-8890 v4 @ 2.20GHz

4 "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 caution.)

cpu cores : 24

Continued on next page

Standard Performance Evaluation Corporation

info@spec.org

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

Page 2



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint2006 = **71.1**

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

SPECint\_base2006 = **69.4**

CPU2006 license: 9017

Test date: Jul-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jul-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

### Platform Notes (Continued)

```

siblings      : 24
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
27 28 29
cache size   : 61440 KB

From /proc/meminfo
MemTotal:      529159976 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 Draco-02 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 Jul 11 10:05

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   688G  4.9G  683G   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 LENOVO -[A9E135CUS-3.10]- 06/16/2016
Memory:
16x Hynix HMA84GR7MFR4N-UH 32 GB 2 rank 2400 MHz, configured at 1600 MHz
Continued on next page

```



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECint2006 = 71.1**

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

**SPECint\_base2006 = 69.4**

**CPU2006 license:** 9017

**Test date:** Jul-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Jul-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015

## Platform Notes (Continued)

80x NO DIMM Unknown

(End of data from sysinfo program)

## 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-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

OMP\_NUM\_THREADS = "96"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## 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 -opt-prefetch -auto-p32

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Lenovo Group Limited

SPECint2006 = 71.1

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

SPECint\_base2006 = 69.4

CPU2006 license: 9017

Test date: Jul-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jul-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

## Base Optimization Flags (Continued)

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32  
-Wl,-z,muldefs -L/sh -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\_2016/linux/compiler/lib/ia32\_lin

445.gobmk: icc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

C++ benchmarks (except as noted below):

icpc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

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



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint2006 = 71.1

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

SPECint\_base2006 = 69.4

CPU2006 license: 9017

Test date: Jul-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jul-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

## Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch  
-ansi-alias

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div  
-par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32  
-opt-prefetch -ansi-alias

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

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

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias

456.hmmer: basepeak = yes

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2)  
-opt-ra-region-strategy=block -ansi-alias  
-Wl,-z,muldefs -L/sh -lsmartheap

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

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch  
-ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint2006 = 71.1

Lenovo System x3850 X6 Essential  
(2.20 GHz, Intel Xeon E7-8890 v4)

SPECint\_base2006 = 69.4

CPU2006 license: 9017

Test date: Jul-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jul-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

## 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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-BDW-B.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-BDW-B.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 Tue Sep 6 16:57:59 2016 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 6 September 2016.

Standard Performance Evaluation Corporation

[info@spec.org](mailto:info@spec.org)

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