



# SPEC® CINT2006 Result

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## Lenovo Group Limited

**SPECint®2006 = 61.4**

Lenovo System x3850 X6  
(Intel Xeon E7-8860 v3, 2.20 GHz)

**SPECint\_base2006 = 59.5**

**CPU2006 license:** 9017

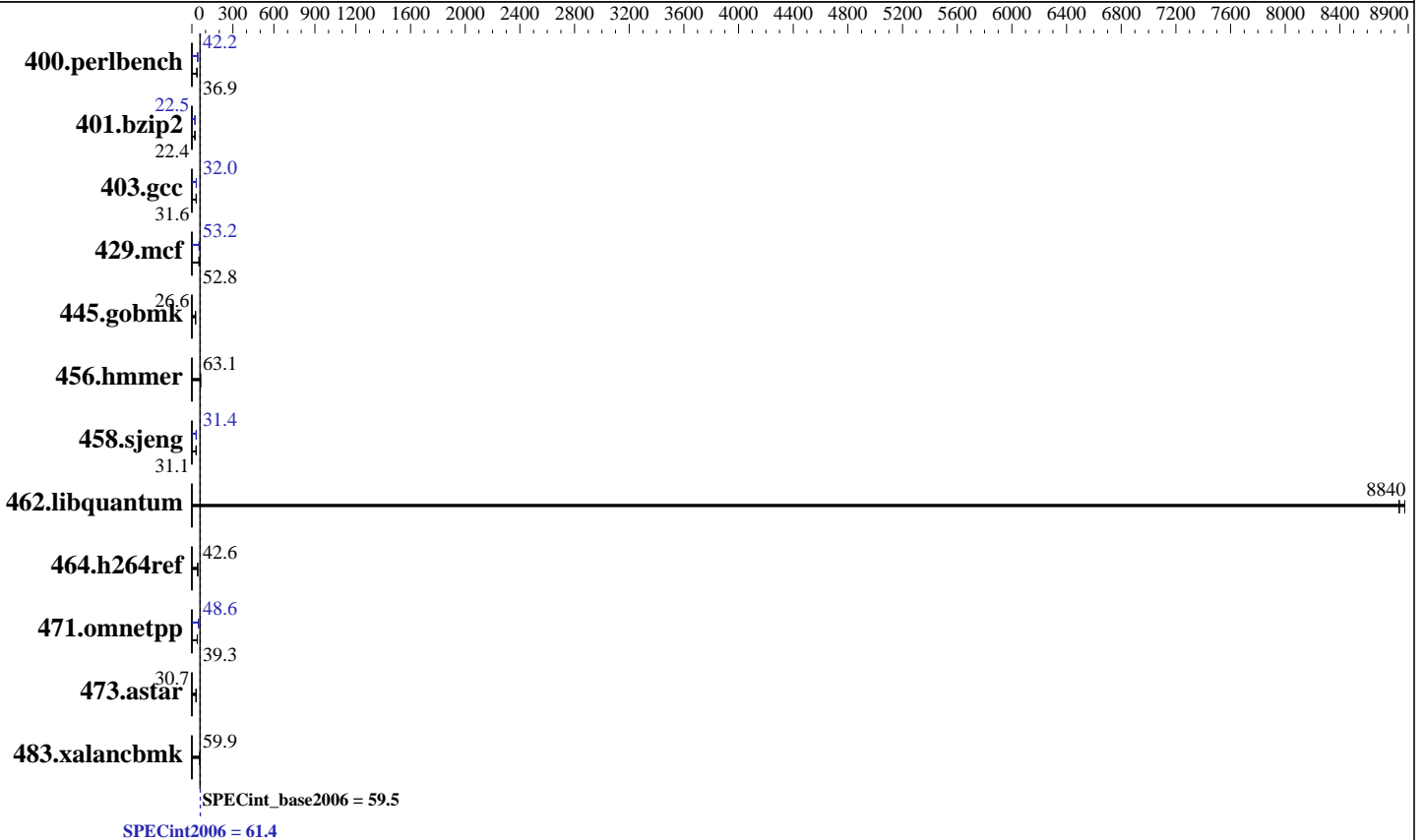
**Test date:** Jul-2015

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Jul-2015

**Tested by:** Lenovo Group Limited

**Software Availability:** Oct-2014



### Hardware

**CPU Name:** Intel Xeon E7-8860 v3  
**CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz  
**CPU MHz:** 2200  
**FPU:** Integrated  
**CPU(s) enabled:** 64 cores, 4 chips, 16 cores/chip  
**CPU(s) orderable:** 4,6,8 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:** 40 MB I+D on chip per chip  
**Other Cache:** None  
**Memory:** 1 TB (64 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
**Disk Subsystem:** 1 x 400 GB SAS SSD  
**Other Hardware:** None

### Software

**Operating System:** SUSE Linus Enterprise Server 12 (x86\_64) 3.12.28-4-default  
**Compiler:** C/C++: Version 15.0.0.090 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 V10.0



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## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	264	37.0	<b><u>265</u></b>	<b><u>36.9</u></b>	266	36.8	232	42.2	231	42.3	<b><u>232</u></b>	<b><u>42.2</u></b>
401.bzip2	432	22.3	430	22.4	<b><u>431</u></b>	<b><u>22.4</u></b>	428	22.5	<b><u>429</u></b>	<b><u>22.5</u></b>	429	22.5
403.gcc	255	31.5	<b><u>255</u></b>	<b><u>31.6</u></b>	254	31.7	252	31.9	250	32.2	<b><u>252</u></b>	<b><u>32.0</u></b>
429.mcf	172	53.1	<b><u>173</u></b>	<b><u>52.8</u></b>	176	51.9	174	52.4	<b><u>171</u></b>	<b><u>53.2</u></b>	171	53.4
445.gobmk	394	26.6	395	26.6	<b><u>394</u></b>	<b><u>26.6</u></b>	394	26.6	395	26.6	<b><u>394</u></b>	<b><u>26.6</u></b>
456.hammer	148	63.0	148	63.1	<b><u>148</u></b>	<b><u>63.1</u></b>	148	63.0	148	63.1	<b><u>148</u></b>	<b><u>63.1</u></b>
458.sjeng	<b><u>389</u></b>	<b><u>31.1</u></b>	390	31.1	388	31.2	<b><u>386</u></b>	<b><u>31.4</u></b>	386	31.3	386	31.4
462.libquantum	<b><u>2.34</u></b>	<b><u>8840</u></b>	2.33	8870	2.35	8830	<b><u>2.34</u></b>	<b><u>8840</u></b>	2.33	8870	2.35	8830
464.h264ref	<b><u>520</u></b>	<b><u>42.6</u></b>	519	42.6	524	42.3	<b><u>520</u></b>	<b><u>42.6</u></b>	519	42.6	524	42.3
471.omnetpp	156	40.2	<b><u>159</u></b>	<b><u>39.3</u></b>	160	39.2	130	48.2	128	48.9	<b><u>129</u></b>	<b><u>48.6</u></b>
473.astar	228	30.8	230	30.5	<b><u>229</u></b>	<b><u>30.7</u></b>	228	30.8	230	30.5	<b><u>229</u></b>	<b><u>30.7</u></b>
483.xalancbmk	115	59.9	120	57.5	<b><u>115</u></b>	<b><u>59.9</u></b>	115	59.9	120	57.5	<b><u>115</u></b>	<b><u>59.9</u></b>

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

Operating Mode set to Custom in BIOS  
 Cstates disabled in BIOS  
 Hyperthreading disabled in BIOS  
 Energy Efficient Turbo disabled in BIOS  
 Sysinfo program /cpu2006.1.2\_15.0/config/sysinfo.rev6914  
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
 running on linux-sar5 Fri Jul 24 16:39:34 2015

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 E7-8860 v3 @ 2.20GHz  
 4 "physical id"s (chips)  
 64 "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 : 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
cache size : 40960 KB

```

From /proc/meminfo

```

MemTotal:      1058693472 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

/usr/bin/lsb\_release -d

SUSE Linux Enterprise Server 12

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

SuSE-release:

SUSE Linux Enterprise Server 12 (x86\_64)

VERSION = 12

PATCHLEVEL = 0

# 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"

VERSION\_ID="12"

PRETTY\_NAME="SUSE Linux Enterprise Server 12"

ID="sles"

ANSI\_COLOR="0;32"

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

uname -a:

```

Linux linux-sar5 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
(9879bd4) x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Jul 24 16:38 last=5

SPEC is set to: /cpu2006.1.2\_15.0

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3        xfs   371G  219G  152G  60% /

```

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 IBM -[A9E121SUS-1.00]- 03/13/2015

Memory:

```

64x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600 MHz

```

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## Platform Notes (Continued)

32x 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,scatter"

LD\_LIBRARY\_PATH = "/cpu2006.1.2\_15.0/libs/32:/cpu2006.1.2\_15.0/libs/64:/cpu2006.1.2\_15.0/sh"

OMP\_NUM\_THREADS = "64"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

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

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## 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/composer\_xe\_2015/lib/ia32

C++ benchmarks (except as noted below):

icpc -m64

471.omnetpp: icpc -m32 -L/opt/intel/composer\_xe\_2015/lib/ia32

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_LINUX\_IA32

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

473.astar: -DSPEC\_CPU\_LP64

483.xalancbmk: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX

## Peak Optimization Flags

C benchmarks:

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

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## Peak Optimization Flags (Continued)

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div -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: basepeak = yes

456.hmmer: basepeak = yes

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

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

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

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

## 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-ic15.0-official-linux64.html>

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

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

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-CC.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Wed Aug 12 11:07:58 2015 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 12 August 2015.