



# SPEC<sup>®</sup> CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint<sup>®</sup>\_rate2006 = 1580

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

SPECint\_rate\_base2006 = 1510

CPU2006 license: 9017

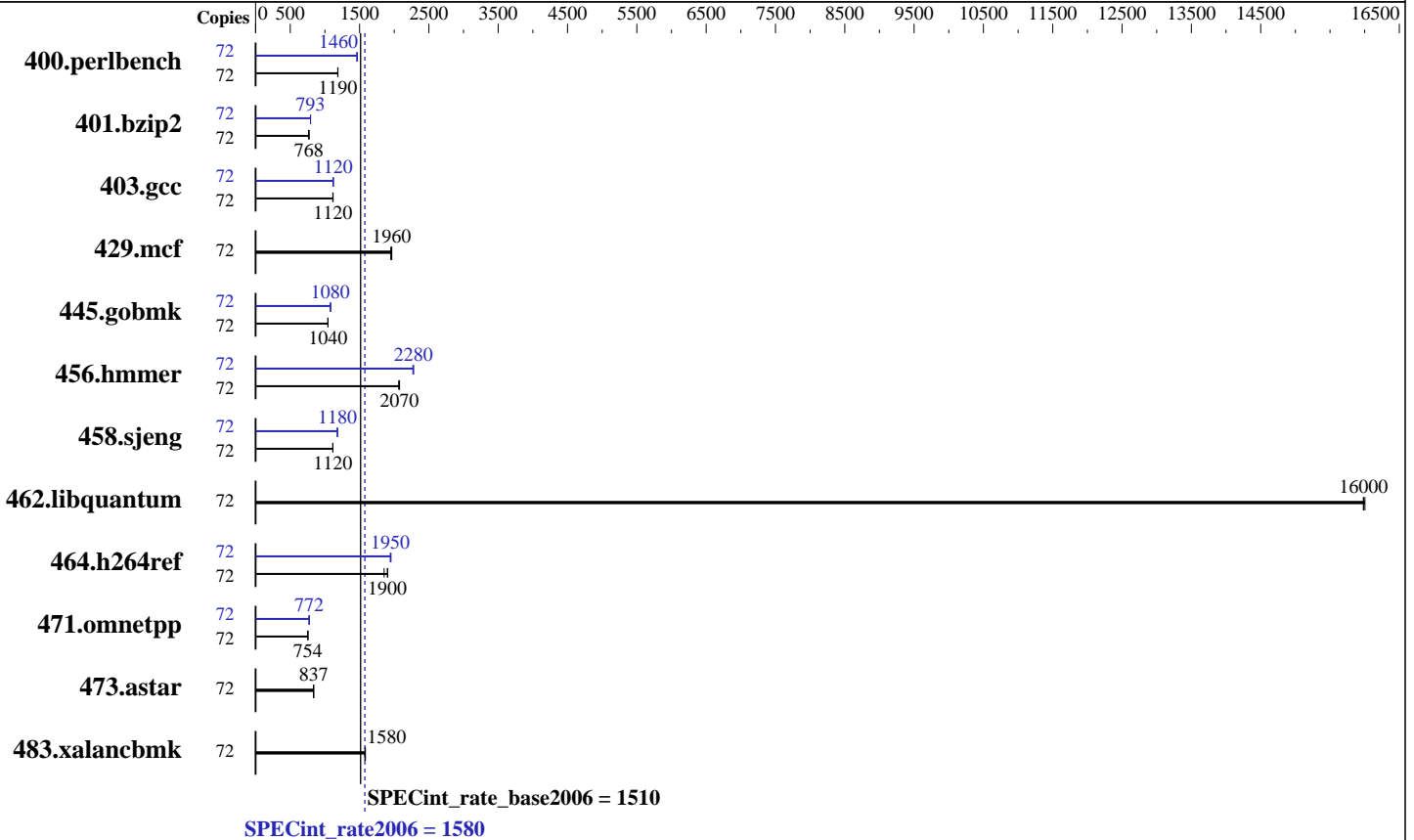
Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015



### Hardware

CPU Name: Intel Xeon E5-2697 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 36 cores, 2 chips, 18 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: 256 KB I+D on chip per core  
 L3 Cache: 45 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)  
 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: No  
 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 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint\_rate2006 = 1580

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

SPECint\_rate\_base2006 = 1510

CPU2006 license: 9017

Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

## Results Table

| Benchmark      | Base   |            |             |             |              |            |             | Peak   |            |             |             |              |            |             |
|----------------|--------|------------|-------------|-------------|--------------|------------|-------------|--------|------------|-------------|-------------|--------------|------------|-------------|
|                | Copies | Seconds    | Ratio       | Seconds     | Ratio        | Seconds    | Ratio       | Copies | Seconds    | Ratio       | Seconds     | Ratio        | Seconds    | Ratio       |
| 400.perlbench  | 72     | 594        | 1180        | <u>593</u>  | <u>1190</u>  | 592        | 1190        | 72     | <u>481</u> | <u>1460</u> | 479         | 1470         | 481        | 1460        |
| 401.bzip2      | 72     | 906        | 767         | 901         | 771          | <u>904</u> | <u>768</u>  | 72     | 876        | 793         | <u>877</u>  | <u>793</u>   | 877        | 792         |
| 403.gcc        | 72     | 520        | 1110        | <u>520</u>  | <u>1120</u>  | 518        | 1120        | 72     | <u>518</u> | <u>1120</u> | 519         | 1120         | 516        | 1120        |
| 429.mcf        | 72     | 334        | 1960        | 337         | 1950         | <u>334</u> | <u>1960</u> | 72     | 334        | 1960        | 337         | 1950         | <u>334</u> | <u>1960</u> |
| 445.gobmk      | 72     | 723        | 1040        | <u>723</u>  | <u>1040</u>  | 724        | 1040        | 72     | 699        | 1080        | 698         | 1080         | <u>699</u> | <u>1080</u> |
| 456.hammer     | 72     | 325        | 2060        | <u>324</u>  | <u>2070</u>  | 323        | 2080        | 72     | <u>295</u> | <u>2280</u> | 296         | 2270         | 295        | 2280        |
| 458.sjeng      | 72     | 782        | 1110        | <u>781</u>  | <u>1120</u>  | 781        | 1120        | 72     | 738        | 1180        | <u>738</u>  | <u>1180</u>  | 738        | 1180        |
| 462.libquantum | 72     | 93.4       | 16000       | <u>93.3</u> | <u>16000</u> | 93.2       | 16000       | 72     | 93.4       | 16000       | <u>93.3</u> | <u>16000</u> | 93.2       | 16000       |
| 464.h264ref    | 72     | 859        | 1850        | 835         | 1910         | <u>839</u> | <u>1900</u> | 72     | 815        | 1950        | 820         | 1940         | <u>819</u> | <u>1950</u> |
| 471.omnetpp    | 72     | 597        | 754         | <u>597</u>  | <u>754</u>   | 597        | 754         | 72     | 582        | 773         | 583         | 771          | <u>583</u> | <u>772</u>  |
| 473.astar      | 72     | <u>604</u> | <u>837</u>  | 604         | 836          | 603        | 838         | 72     | <u>604</u> | <u>837</u>  | 604         | 836          | 603        | 838         |
| 483.xalancbmk  | 72     | <u>315</u> | <u>1580</u> | 315         | 1580         | 314        | 1580        | 72     | <u>315</u> | <u>1580</u> | 315         | 1580         | 314        | 1580        |

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"  
Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/transparent\_hugepage/enabled  
Filesystem page cache cleared with:  
echo 1 > /proc/sys/vm/drop\_caches

## Platform Notes

BIOS Configuration:  
Operating Mode set to "Maximum Performance"  
COD Preference set to Enable  
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on NX360 Wed Jun 15 10:29:20 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 E5-2697 v4 @ 2.30GHz  
Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECint\_rate2006 = 1580

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

SPECint\_rate\_base2006 = 1510

CPU2006 license: 9017

Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

### Platform Notes (Continued)

2 "physical id"s (chips)  
72 "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 : 18
siblings  : 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 23040 KB
```

From /proc/meminfo

```
MemTotal:      263960348 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 NX360 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 Jun 15 10:25

SPEC is set to: /home/cpu2006-1.2-ic16.0

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4        xfs   690G  7.5G  683G   2% /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 -[THE124GUS-2.10]- 04/28/2016

Memory:

```
16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz
Continued on next page
```



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECint\_rate2006 = 1580**

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

**SPECint\_rate\_base2006 = 1510**

**CPU2006 license:** 9017

**Test date:** Jun-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Mar-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015

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

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
```

Filesystem page cache cleared with:

```
echo 1> /proc/sys/vm/drop_caches
```

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_2016/linux/compiler/lib/ia32_lin
```

C++ benchmarks:

```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

## 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 -opt-prefetch
-opt-mem-layout-trans=3
```

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Lenovo Group Limited

SPECint\_rate2006 = 1580

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

SPECint\_rate\_base2006 = 1510

CPU2006 license: 9017

Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-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  
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmarthearp

## 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\_2016/linux/compiler/lib/ia32\_lin

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\_2016/linux/compiler/lib/ia32\_lin

## Peak Portability Flags

400.perlbench: -D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64

401.bzip2: -D\_FILE\_OFFSET\_BITS=64 -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: -D\_FILE\_OFFSET\_BITS=64 -DSPEC\_CPU\_LP64

458.sjeng: -D\_FILE\_OFFSET\_BITS=64 -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 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

**SPECint\_rate2006 = 1580**

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

**SPECint\_rate\_base2006 = 1510**

**CPU2006 license:** 9017

**Test date:** Jun-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Mar-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) -auto-ilp32
- 401.bzip2: -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  
-auto-ilp32 -ansi-alias
- 403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div
- 429.mcf: basepeak = yes
- 445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias  
-opt-mem-layout-trans=3
- 456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
- 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  
-auto-ilp32
- 462.libquantum: basepeak = yes
- 464.h264ref: -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) -unroll2  
-ansi-alias

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) -ansi-alias  
-opt-ra-region-strategy=block -Wl,-z,muldefs  
-L/sh -lsmartheap
- 473.astar: basepeak = yes
- 483.xalancbmk: basepeak = yes



# SPEC CINT2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECint\_rate2006 = 1580**

Lenovo NeXtScale nx360 M5  
(2.30 GHz, Intel Xeon E5-2697 v4)

**SPECint\_rate\_base2006 = 1510**

**CPU2006 license:** 9017

**Test date:** Jun-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Mar-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 Jul 12 11:04:23 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 12 July 2016.