Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

CPU Name: Intel Xeon E5-2637 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3500
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: 15 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

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

SPECint®2006 = 68.4
SPECint_base2006 = 65.7

Copyright 2006-2016 Standard Performance Evaluation Corporation
Lenovo Group Limited
Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECint2006 = 68.4
SPECint_base2006 = 65.7

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>226</td>
<td>43.2</td>
<td>224</td>
<td>43.7</td>
<td>225</td>
<td>43.5</td>
<td></td>
<td>206</td>
<td>47.4</td>
<td></td>
<td>207</td>
<td>47.3</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>361</td>
<td>26.8</td>
<td>361</td>
<td>26.7</td>
<td>360</td>
<td>26.8</td>
<td></td>
<td>354</td>
<td>27.3</td>
<td></td>
<td>354</td>
<td>27.3</td>
</tr>
<tr>
<td>403.gcc</td>
<td>211</td>
<td>38.2</td>
<td>210</td>
<td>38.2</td>
<td>211</td>
<td>38.2</td>
<td></td>
<td>215</td>
<td>37.5</td>
<td></td>
<td>212</td>
<td>37.9</td>
</tr>
<tr>
<td>429.mcf</td>
<td>130</td>
<td>70.4</td>
<td>128</td>
<td>71.1</td>
<td>130</td>
<td>69.9</td>
<td></td>
<td>129</td>
<td>70.7</td>
<td></td>
<td>129</td>
<td>70.4</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>335</td>
<td>31.3</td>
<td>335</td>
<td>31.3</td>
<td>335</td>
<td>31.3</td>
<td></td>
<td>336</td>
<td>31.2</td>
<td></td>
<td>336</td>
<td>31.2</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>102</td>
<td>91.4</td>
<td>102</td>
<td>91.3</td>
<td>102</td>
<td>91.4</td>
<td></td>
<td>102</td>
<td>91.4</td>
<td></td>
<td>102</td>
<td>91.4</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>333</td>
<td>36.3</td>
<td>333</td>
<td>36.3</td>
<td>333</td>
<td>36.3</td>
<td></td>
<td>330</td>
<td>36.7</td>
<td></td>
<td>330</td>
<td>36.7</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>5.28</td>
<td>3920</td>
<td>5.27</td>
<td>3930</td>
<td>5.20</td>
<td>3990</td>
<td></td>
<td>5.28</td>
<td>3920</td>
<td></td>
<td>5.27</td>
<td>3930</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>350</td>
<td>63.3</td>
<td>351</td>
<td>63.1</td>
<td>349</td>
<td>63.5</td>
<td></td>
<td>350</td>
<td>63.3</td>
<td></td>
<td>351</td>
<td>63.1</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>229</td>
<td>27.3</td>
<td>231</td>
<td>27.1</td>
<td>230</td>
<td>27.2</td>
<td></td>
<td>172</td>
<td>36.4</td>
<td></td>
<td>171</td>
<td>36.5</td>
</tr>
<tr>
<td>473.astar</td>
<td>184</td>
<td>38.2</td>
<td>183</td>
<td>38.3</td>
<td>184</td>
<td>38.2</td>
<td></td>
<td>184</td>
<td>38.1</td>
<td></td>
<td>183</td>
<td>38.3</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>90.1</td>
<td>76.6</td>
<td>89.6</td>
<td>77.0</td>
<td>90.0</td>
<td>76.6</td>
<td></td>
<td>81.2</td>
<td>85.0</td>
<td></td>
<td>81.1</td>
<td>85.0</td>
</tr>
</tbody>
</table>

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"
Intel Hyperthreading set to Disabled
COD Preference set to Disable
Early Snoop Preference set to Disable
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1
running on WILYKAT-06 Wed May 18 20:07:29 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 E5-2637 v4 @ 3.50GHz
  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
Continued on next page
Lenovo Group Limited
Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECint2006 = 68.4
SPECint_base2006 = 65.7

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Platform Notes (Continued)

cautions.

cpu cores : 4
siblings : 4
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 15360 KB

From /proc/meminfo
MemTotal: 263968528 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"
PATTERN="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 18 20:01

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

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

(End of data from sysinfo program)
Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

**SPECint2006** = 68.4
**SPECint_base2006** = 65.7

**CPU2006 license:** 9017  
**Test date:** May-2016

**Test sponsor:** Lenovo Group Limited  
**Hardware Availability:** Mar-2016

**Tested by:** Lenovo Group Limited  
**Software Availability:** Dec-2015

---

**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 = "8"

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**

C benchmarks:

- -DSPEC_CPU_LP64
- -DSPEC_CPU_LINUX_X64

C++ benchmarks:

- -DSPEC_CPU_LP64
- -DSPEC_CPU_LINUX

---

**Base Optimization Flags**

C benchmarks:

- -xCORE-AVX2
- -ipo -O3
- -no-prec-div
- -parallel
- -opt-prefetch
- -auto-p32

C++ benchmarks:

- -xCORE-AVX2
- -ipo -O3
- -no-prec-div
- -opt-prefetch
- -auto-p32
- -Wl,-z,muldefs -L/sh -lsmartheap64
Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECint2006 = 68.4
SPECint_base2006 = 65.7

CPU2006 license: 9017
Test date: May-2016
Test sponsor: Lenovo Group Limited
Hardware Availability: Mar-2016
Tested by: Lenovo Group Limited
Software Availability: Dec-2015

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

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

Continued on next page
Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

**SPECint2006 =** 68.4  
**SPECint_base2006 =** 65.7

<table>
<thead>
<tr>
<th>CPU2006 license: 9017</th>
<th>Test date: May-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor: Lenovo Group Limited</td>
<td>Hardware Availability: Mar-2016</td>
</tr>
<tr>
<td>Tested by: Lenovo Group Limited</td>
<td>Software Availability: Dec-2015</td>
</tr>
</tbody>
</table>

### Peak Optimization Flags (Continued)

- **401.bzip2 (continued):**
  - `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`

### 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
Lenovo Group Limited
Lenovo NeXtScale nx360 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECint2006 = 68.4
SPECint_base2006 = 65.7

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

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.

Tested with SPEC CPU2006 v1.2.
Originally published on 28 June 2016.