Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(Intel Xeon E5-2623 v3, 3.00 GHz)

SPECint\_rate2006 = 427
SPECint\_rate\_base2006 = 410

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

Test date: Apr-2015
Hardware Availability: Nov-2014
Software Availability: Sep-2014

### Hardware

CPU Name: Intel Xeon E5-2623 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz: 3000
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 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: 10 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)
Disk Subsystem: 1 x 1000 GB SATA, 7200 RPM
Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo) 3.10.0-123.el7.x86_64
Compiler: C/C++: Version 15.0.0.090 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 V10.0
# SPEC CINT2006 Result

**Lenovo Group Limited**

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<table>
<thead>
<tr>
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**SPECint_rate2006** = 427

**SPECint_rate_base2006** = 410

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## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>400.perlbench</td>
<td>16</td>
<td>532</td>
<td>294</td>
<td>532</td>
<td>294</td>
<td>427</td>
<td>427</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>16</td>
<td>796</td>
<td>194</td>
<td>794</td>
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<td>410</td>
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<tr>
<td>403.mcf</td>
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<td>504</td>
<td>427</td>
<td>427</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>16</td>
<td>609</td>
<td>275</td>
<td>609</td>
<td>275</td>
<td>427</td>
<td>427</td>
</tr>
<tr>
<td>456.hmmer</td>
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<td>244</td>
<td>611</td>
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<td>605</td>
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<td>427</td>
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<tr>
<td>458.sjeng</td>
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<td>294</td>
<td>658</td>
<td>294</td>
<td>427</td>
<td>427</td>
</tr>
<tr>
<td>462.libquantum</td>
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<td>76.2</td>
<td>4350</td>
<td>76.5</td>
<td>4330</td>
<td>427</td>
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</tr>
<tr>
<td>464.h264ref</td>
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<td>729</td>
<td>486</td>
<td>726</td>
<td>488</td>
<td>427</td>
<td>427</td>
</tr>
<tr>
<td>471.omnetpp</td>
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<td>467</td>
<td>214</td>
<td>465</td>
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<td>427</td>
</tr>
<tr>
<td>473.astar</td>
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<td>469</td>
<td>239</td>
<td>468</td>
<td>240</td>
<td>427</td>
<td>427</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>16</td>
<td>237</td>
<td>465</td>
<td>237</td>
<td>465</td>
<td>427</td>
<td>427</td>
</tr>
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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"

## Platform Notes

BIOS setting:
Operating Mode set to "Efficiency-Favor Performance"
Sysinfo program /home/SPEC/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 $e3fbb8667b5a285932ceab81e28219e1
running on wilykat-2.labs.lenovo.com Thu Apr 30 14:36:09 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 E5-2623 v3 @ 3.00GHz
2 "physical id"s (chips)
16 "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 : 8
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB

From /proc/meminfo
MemTotal: 263587828 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.0 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.0"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
Linux wilykat-2.labs.lenovo.com 3.10.0-123.el7.x86_64 #1 SMP Mon May 5
11:16:57 EDT 2014 x86_64 x86_64 x86_64 GNU/Linux

SPEC is set to: /home/SPEC

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs 927G 9.2G 918G 1% /

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 -[THE106CUS-1.11]- 02/16/2015
Memory:
10x Hynix HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz
6x Hynix HMA42GR7MFR4N-TFT1 16 GB 2 rank 2133 MHz

(End of data from sysinfo program)
System memory running at the CPU supported max DIMM speed (1866 MHz)
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### General Notes

Environment variables set by runspec before the start of the run:

```
LD_LIBRARY_PATH = "~/home/SPEC/libs/32:/home/SPEC/libs/64:/home/SPEC/sh"
```

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
```

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/composer_xe_2015/lib/ia32
```

**C++ benchmarks:**
```
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

### Base Portability Flags

- 400.perlbench: -DSPEC_CPU_LINUX_IA32
- 462.libquantum: -DSPEC_CPU_LINUX
- 483.xalancbmk: -DSPEC_CPU_LINUX

### Base Optimization Flags

**C benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

**C++ benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
-L/sh -lsmartheap
```

### Base Other Flags

**C benchmarks:**
```
403.gcc: -Dalloca=_alloca
```
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Peak Compiler Invocation

C benchmarks (except as noted below):
  icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
  400.perlbench: icc -m64
  401.bzip2: icc -m64
  456.hmmer: icc -m64
  458.sjeng: icc -m64

C++ benchmarks:
  icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -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)
  -auto-ilm32
  401.bzip2: -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 -auto-ilm32 -ansi-alias
  403.gcc: -xCORE-AVX2 -ipo -o3 -no-prec-div
  429.mcf: basepeak = yes
  445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
  -ansi-alias
  456.hmmer: -xCORE-AVX2 -ipo -o3 -no-prec-div -unroll2 -auto-ilm32
  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 -auto-ilm32

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**Peak Optimization Flags (Continued)**

462.libquantum: basepeak = yes

464.h264ref:
- -xCORE-AVX2(pass 2)
- -prof-gen(pass 1)
- -ipo(pass 2)
- -O3(pass 2)
- -no-prec-div(pass 2)
- -prof-use(pass 2)
- -unroll2
- -ansi-alias

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)
- -ansi-alias
- -opt-za-region-strategy=block
- -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/IBM-Platform-Flags-V1.2-HSW-B.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/IBM-Platform-Flags-V1.2-HSW-B.xml

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