Lenovo Group Limited
Lenovo NeXtScale nx360 M5
(Intel Xeon E5-2637 v3, 3.50 GHz)

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**CPU2006 license:** 9017  
**Test date:** May-2015  
**Test sponsor:** Lenovo Group Limited  
**Tested by:** Lenovo Group Limited  
**Hardware Availability:** Nov-2014  
**Software Availability:** Sep-2014

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**SPECfp®2006** = 109  
**SPECfp_base2006** = 105

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### SPECfp2006 Results

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<td>433.milc</td>
<td>74.1</td>
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</tr>
<tr>
<td>482.sphinx3</td>
<td>87.3</td>
</tr>
</tbody>
</table>

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### Hardware

| CPU Name: | Intel Xeon E5-2637 v3 |
| 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, 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 |

---

### Software

| Operating System: | Red Hat Enterprise Linux Server release 7.0 (Maipo) |
| Compiler: | C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux; Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | Yes |
| File System: | xfs |

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| L3 Cache: | 15 MB I+D on chip per chip  
| Other Cache: | None  
| Memory: | 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
| Disk Subsystem: | 1 x 1000 GB SATA, 7200 RPM  
| Other Hardware: | None  

| System State: | Run level 3 (multi-user)  
| Base Pointers: | 64-bit  
| Peak Pointers: | 32/64-bit  
| Other Software: | None

**Test date:** May-2015

**Hardware Availability:** Nov-2014

**Test sponsor:** Lenovo Group Limited

**Software Availability:** Sep-2014

### Results Table

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<tr>
<th>Benchmark</th>
<th>Base Seconds</th>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### 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 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab8e28219e1  
running on wilykat-2.labs.lenovo.com Mon May 11 00:31:27 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

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SPECfp2006 = 109
SPECfp_base2006 = 105

Test date: May-2015
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Platform Notes (Continued)

From /proc/cpuinfo
  model name : Intel(R) Xeon(R) CPU E5-2637 v3 @ 3.50GHz
  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.)
    cpu cores : 4
    siblings : 8
    physical 0: cores 0 1 4 5
    physical 1: cores 0 1 4 5
  cache size : 15360 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

run-level 3 May 11 00:20

SPEC is set to: /home/SPEC

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs 927G 13G 914G 2% /

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

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**SPEC CFP2006 Result**

| SPECfp2006 = | 109 |
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**Platform Notes (Continued)**

(End of data from `sysinfo` program)

**General Notes**

Environment variables set by `runspec` before the start of the run:
- `KMP_AFFINITY = "granularity=fine,compact,1,0"
- `LD_LIBRARY_PATH = "/home/SPEC/libs/32:/home/SPEC/libs/64:/home/SPEC/sh"
- `OMP_NUM_THREADS = "8"

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`

Fortran benchmarks:
- `ifort -m64`

Benchmarks using both Fortran and C:
- `icc -m64 ifort -m64`

**Base Portability Flags**

| 410.bwaves: | -DSPEC_CPU_LP64 |
| 416.gamess: | -DSPEC_CPU_LP64 |
| 433.milc: | -DSPEC_CPU_LP64 |
| 434.zeusmp: | -DSPEC_CPU_LP64 |
| 435.gromacs: | -DSPEC_CPU_LP64 -nofor_main |
| 436.cactusADM: | -DSPEC_CPU_LP64 -nofor_main |
| 437.leslie3d: | -DSPEC_CPU_LP64 |
| 444.namd: | -DSPEC_CPU_LP64 |
| 447.dealII: | -DSPEC_CPU_LP64 |
| 450.soplex: | -DSPEC_CPU_LP64 |
| 453.povray: | -DSPEC_CPU_LP64 -nofor_main |
| 454.calculix: | -DSPEC_CPU_LP64 -nofor_main |
| 459.GemsFDTD: | -DSPEC_CPU_LP64 |
| 465.tonto: | -DSPEC_CPU_LP64 |
| 470.lbm: | -DSPEC_CPU_LP64 |

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Base Portability Flags (Continued)

481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

Peak Compiler Invocation

C benchmarks:
icc  -m64

C++ benchmarks:
icpc  -m64

Fortran benchmarks:
ifort  -m64

Benchmarks using both Fortran and C:
icc  -m64 ifort  -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

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**Peak Optimization Flags (Continued)**

433.milc: -xCORE-AVX2 (pass 2) -prof-gen (pass 1) -ipo (pass 2)
-03 (pass 2) -no-prec-div (pass 2) -prof-use (pass 2)
-auto-ilp32 -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

**C++ benchmarks:**

444.namd: -xCORE-AVX2 (pass 2) -prof-gen (pass 1) -ipo (pass 2)
-03 (pass 2) -no-prec-div (pass 2) -prof-use (pass 2)
-fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2 (pass 2) -prof-gen (pass 1) -ipo (pass 2)
-03 (pass 2) -no-prec-div (pass 2) -prof-use (pass 2) -unroll4
-ansi-alias

**Fortran benchmarks:**

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2 (pass 2) -prof-gen (pass 1) -ipo (pass 2)
-03 (pass 2) -no-prec-div (pass 2) -prof-use (pass 2) -unroll2
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2 (pass 2) -prof-gen (pass 1) -ipo (pass 2)
-03 (pass 2) -no-prec-div (pass 2) -prof-use (pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2 (pass 2) -prof-gen (pass 1) -ipo (pass 2)
-03 (pass 2) -no-prec-div (pass 2) -prof-use (pass 2)
-inline-calloc -opt-malloc-options=3 -auto -unroll4

**Benchmarks using both Fortran and C:**

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

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Peak Optimization Flags (Continued)

454.calculix:
-xCORE-AVX2
-ipo
-03
-no-prec-div
-auto-ilp32
-ansi-alias

481.wrf: basepeak = yes

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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For other inquiries, please contact webmaster@spec.org.

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