SPEC® CFP2006 Result
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Lenovo Group Limited

IBM NeXtScale nx360 M4
(Intel Xeon E5-2630L v2, 2.40 GHz)

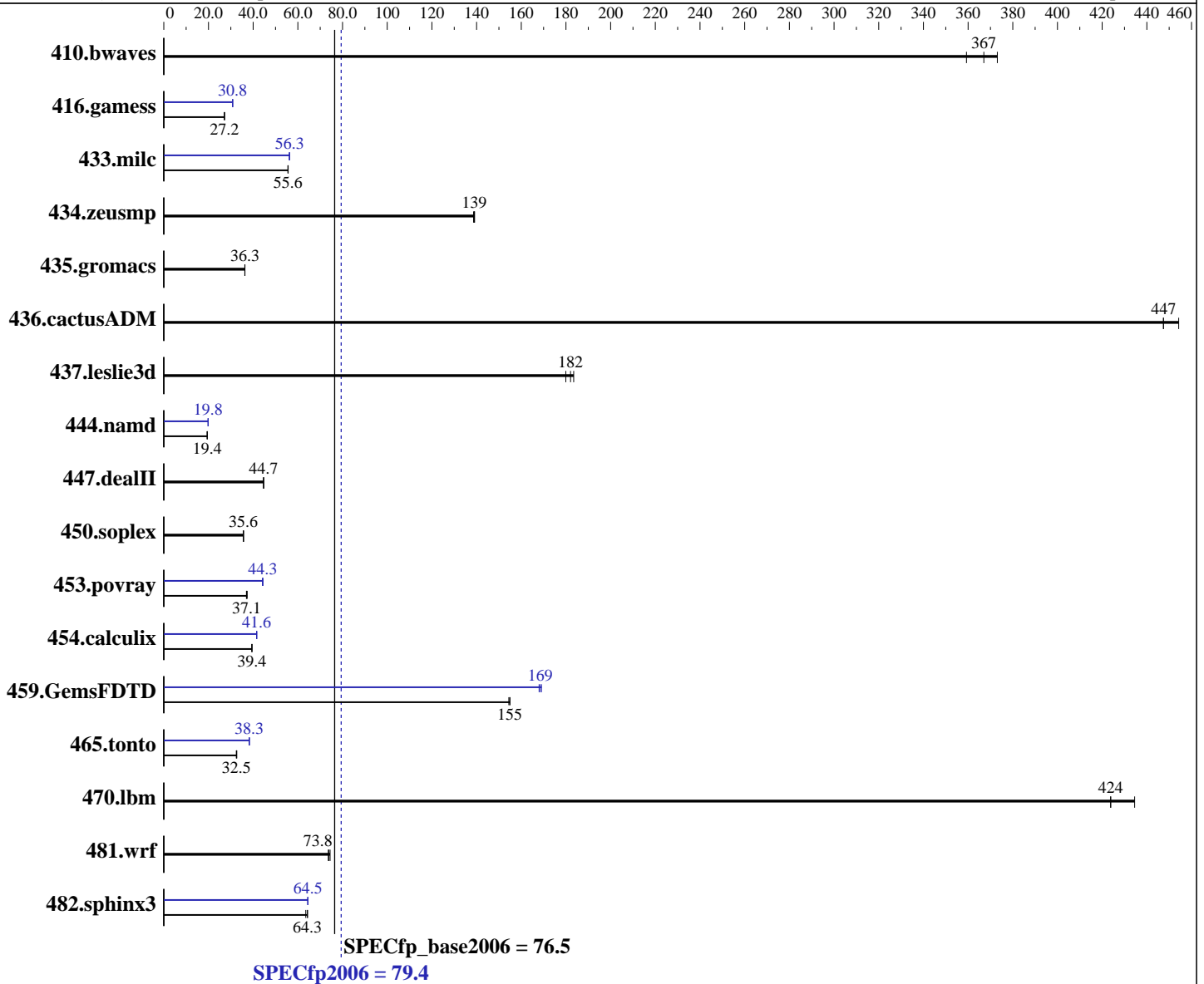$SPECfp^{®}2006 =$ 79.4

$SPECfp\_base2006 =$ 76.5

CPU2006 license: 9017	**Test date:** Oct-2014
Test sponsor: Lenovo Group Limited	**Hardware Availability:** Nov-2013
Tested by: IBM Corporation	**Software Availability:** Sep-2013

410.bwaves 367
416.gamess 30.8 / 27.2
433.milc 56.3 / 55.6
434.zeusmp 139
435.gromacs 36.3
436.cactusADM 447
437.leslie3d 182
444.namd 19.8 / 19.4
447.dealII 44.7
450.soplex 35.6
453.povray 44.3 / 37.1
454.calculix 41.6 / 39.4
459.GemsFDTD 169 / 155
465.tonto 38.3 / 32.5
470.lbm 424
481.wrf 73.8
482.sphinx3 64.5 / 64.3

SPECfp_base2006 = 76.5
SPECfp2006 = 79.4

Hardware

CPU Name:	Intel Xeon E5-2630L v2
CPU Characteristics:	Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 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

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.4 (Santiago) 2.6.32-358.el6.x86_64
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4

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L3 Cache:	15 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	128 GB (8 x 16 GB 2Rx4 PC3-14900R-13, ECC, running at 1600 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	2 x 250 GB SATA, 7200RPM, RAID 0		
Other Hardware:	None		

Results Table

	Base						Peak					
Benchmark	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	37.8	359	36.4	373	**37.0**	**367**	37.8	359	36.4	373	**37.0**	**367**
416.gamess	721	27.2	722	27.1	**721**	**27.2**	635	30.8	636	30.8	**635**	**30.8**
433.milc	165	55.6	**165**	**55.6**	165	55.7	163	56.3	164	56.1	**163**	**56.3**
434.zeusmp	**65.4**	**139**	65.6	139	65.4	139	**65.4**	**139**	65.6	139	65.4	139
435.gromacs	197	36.3	197	36.3	**197**	**36.3**	197	36.3	197	36.3	**197**	**36.3**
436.cactusADM	26.7	447	26.3	454	**26.7**	**447**	26.7	447	26.3	454	**26.7**	**447**
437.leslie3d	**51.6**	**182**	52.2	180	51.2	183	**51.6**	**182**	52.2	180	51.2	183
444.namd	**413**	**19.4**	413	19.4	412	19.5	**404**	**19.8**	404	19.8	405	19.8
447.dealII	**256**	**44.7**	256	44.7	256	44.7	**256**	**44.7**	256	44.7	256	44.7
450.soplex	**234**	**35.6**	234	35.7	234	35.6	**234**	**35.6**	234	35.7	234	35.6
453.povray	143	37.3	**143**	**37.1**	144	37.0	120	44.4	**120**	**44.3**	121	44.1
454.calculix	209	39.4	209	39.4	**209**	**39.4**	**198**	**41.6**	198	41.6	198	41.6
459.GemsFDTD	68.5	155	**68.5**	**155**	68.7	154	**63.0**	**169**	63.2	168	62.8	169
465.tonto	**303**	**32.5**	303	32.5	301	32.7	257	38.2	257	38.3	**257**	**38.3**
470.lbm	32.4	424	31.6	435	**32.4**	**424**	32.4	424	31.6	435	**32.4**	**424**
481.wrf	152	73.6	150	74.4	**151**	**73.8**	152	73.6	150	74.4	**151**	**73.8**
482.sphinx3	303	64.3	307	63.5	**303**	**64.3**	302	64.5	303	64.4	**302**	**64.5**

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"
Zone reclaim mode enabled with:
echo 1 > /proc/sys/vm/zone_reclaim_mode
Intel Idle Driver disabled with the following Linux kernel parameter in /etc/grub.conf:
intel_idle.max_cstate=0
```

Platform Notes

```
BIOS setting:
Operating Mode set to Maximum Performance
Hyper-Threading set to Disable
Sysinfo program /home/SPECcpu-20140116-ic14.0/config/sysinfo.rev6874
$Rev: 6874 $ $Date:: 2013-11-20 #$ 654bd3fcf53b06faef0efe54ed011998
```

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Platform Notes (Continued)

```
running on nx360M4 Tue Oct 28 17:58:05 2014

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 E5-2630L v2 @ 2.40GHz
      2 "physical id"s (chips)
      12 "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 : 6
      siblings  : 6
      physical 0: cores 0 1 2 3 4 5
      physical 1: cores 0 1 2 3 4 5
   cache size : 15360 KB

From /proc/meminfo
   MemTotal:       132090624 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.4 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux nx360M4 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 26 06:00

SPEC is set to: /home/SPECcpu-20140116-ic14.0
   Filesystem     Type     Size  Used Avail Use% Mounted on
   /dev/mapper/vg_nx360m4-lv_home
                  ext4     403G   14G  370G   4% /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 IBM -[FHE107NUS-1.20]- 06/03/2014
   Memory:
      8x Samsung M393B2G70QH0-CMA 16 GB 2 rank 1866 MHz, configured at 1600 MHz
```

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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,0,1"
LD_LIBRARY_PATH = "/home/SPECcpu-20140116-ic14.0/libs/32:/home/SPECcpu-20140116-ic14.0/libs/64:/home/SPECcpu-20140116-ic14.0/sh"
OMP_NUM_THREADS = "12"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

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
   454.calculix: -DSPEC_CPU_LP64 -nofor_main
  459.GemsFDTD: -DSPEC_CPU_LP64
```

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Base Portability Flags (Continued)

```
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64
```

Base Optimization Flags

C benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias
```

C++ benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xAVX -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: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -prof-use(pass 2) -auto-ilp32`
`-ansi-alias`

470.lbm: `basepeak = yes`

482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias`
`-parallel`

C++ benchmarks:

444.namd: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(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: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias`

Fortran benchmarks:

410.bwaves: `basepeak = yes`

416.gamess: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(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: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -prof-use(pass 2) -unroll2`
`-inline-level=0 -opt-prefetch -parallel`

465.tonto: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(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`

454.calculix: `-xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

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Peak Optimization Flags (Continued)

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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-C.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-C.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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