SPEC® CFP2006 Result

Lenovo Group Limited

$SPECfp^{®}_rate2006 = $ 286

Lenovo NeXtScale nx360 M5
(Intel Xeon E5-2603 v3, 1.60 GHz)

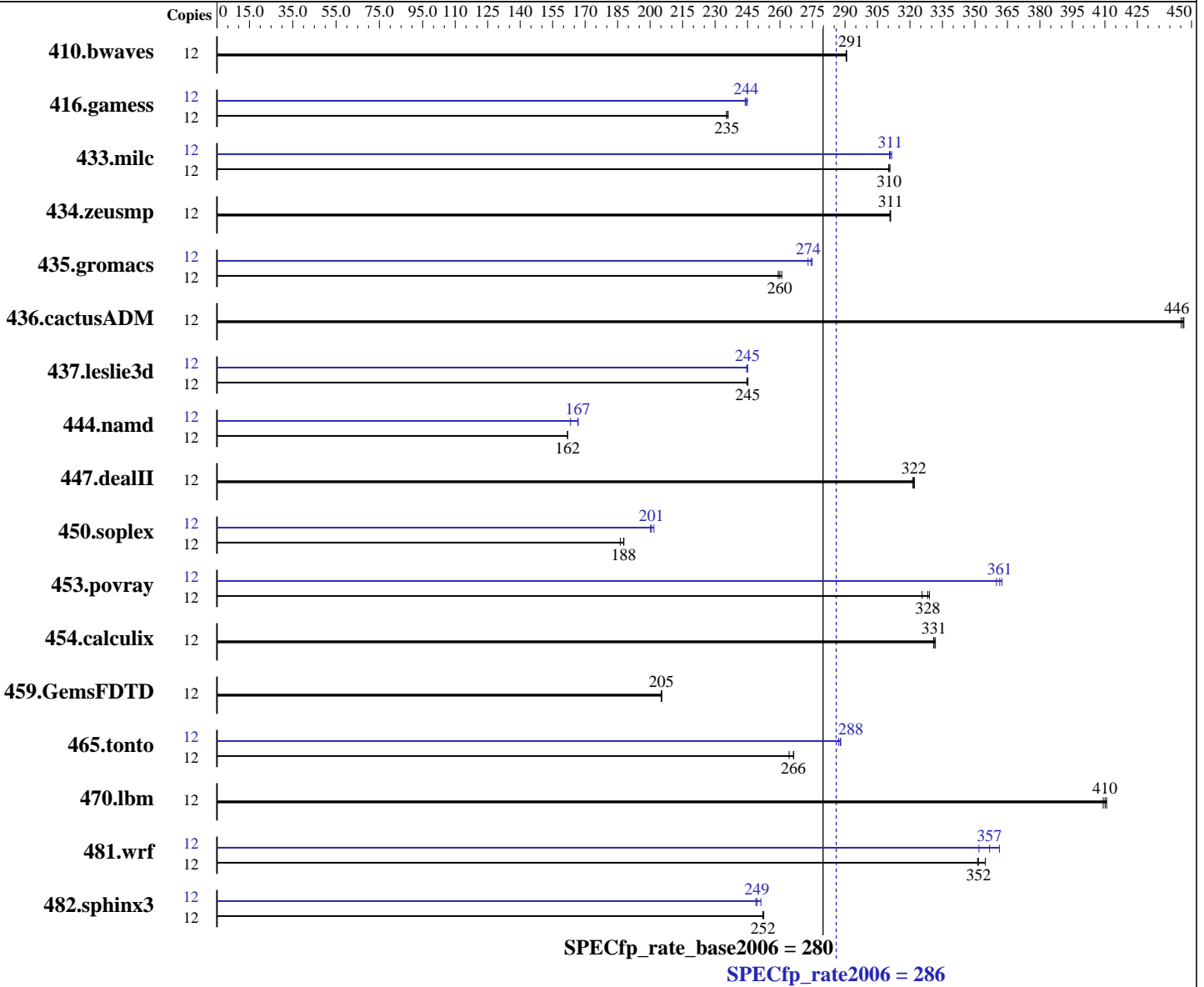$SPECfp_rate_base2006 = $ 280

Copies	Benchmark	Result
12	410.bwaves	291
12	416.gamess	244
12	416.gamess	235
12	433.milc	311
12	433.milc	310
12	434.zeusmp	311
12	435.gromacs	274
12	435.gromacs	260
12	436.cactusADM	446
12	437.leslie3d	245
12	437.leslie3d	245
12	444.namd	167
12	444.namd	162
12	447.dealII	322
12	450.soplex	201
12	450.soplex	188
12	453.povray	361
12	453.povray	328
12	454.calculix	331
12	459.GemsFDTD	205
12	465.tonto	288
12	465.tonto	266
12	470.lbm	410
12	481.wrf	357
12	481.wrf	352
12	482.sphinx3	249
12	482.sphinx3	252

SPECfp_rate_base2006 = 280

SPECfp_rate2006 = 286

Hardware

CPU Name:	Intel Xeon E5-2603 v3
CPU Characteristics:	
CPU MHz:	1600
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 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; Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	xfs

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SPEC CFP2006 Result
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Lenovo NeXtScale nx360 M5
(Intel Xeon E5-2603 v3, 1.60 GHz)

$SPECfp_rate2006 = $ **286**

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

L3 Cache:	15 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 1000 GB SATA, 7200 RPM		
Other Hardware:	None		

Results Table

Benchmark		Base							Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	12	**561**	**291**	561	291	561	291	12	**561**	**291**	561	291	561	291
416.gamess	12	**998**	**235**	995	236	998	235	12	**961**	**244**	963	244	959	245
433.milc	12	**355**	**310**	354	311	355	310	12	355	311	354	312	**354**	**311**
434.zeusmp	12	351	311	**351**	**311**	351	311	12	351	311	**351**	**311**	351	311
435.gromacs	12	331	259	329	261	**330**	**260**	12	**312**	**274**	312	275	314	273
436.cactusADM	12	322	445	**321**	**446**	321	446	12	322	445	**321**	**446**	321	446
437.leslie3d	12	461	245	**460**	**245**	460	245	12	460	245	**460**	**245**	461	245
444.namd	12	594	162	**594**	**162**	594	162	12	**577**	**167**	577	167	589	163
447.dealII	12	427	321	426	322	**427**	**322**	12	427	321	426	322	**427**	**322**
450.soplex	12	533	188	537	186	**533**	**188**	12	496	202	500	200	**499**	**201**
453.povray	12	196	326	**194**	**328**	194	329	12	177	360	**177**	**361**	176	362
454.calculix	12	298	332	**299**	**331**	299	331	12	298	332	**299**	**331**	299	331
459.GemsFDTD	12	**620**	**205**	620	205	621	205	12	**620**	**205**	620	205	621	205
465.tonto	12	443	266	447	264	**444**	**266**	12	411	287	**410**	**288**	410	288
470.lbm	12	401	411	**402**	**410**	403	409	12	401	411	**402**	**410**	403	409
481.wrf	12	378	355	**381**	**352**	382	351	12	**376**	**357**	371	361	381	352
482.sphinx3	12	**928**	**252**	928	252	926	252	12	**938**	**249**	931	251	940	249

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
                      Continued on next page

SPEC CFP2006 Result
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Lenovo NeXtScale nx360 M5
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SPECfp_rate2006 =   286

SPECfp_rate_base2006 =   280

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

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

Platform Notes (Continued)

```
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on wilykat-2.labs.lenovo.com Wed Jun 17 15:54:05 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 E5-2603 v3 @ 1.60GHz
      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:       263588292 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   22G  906G   3% /
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
```

SPEC CFP2006 Result
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Lenovo NeXtScale nx360 M5
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$SPECfp_rate2006 = $ 286

$SPECfp_rate_base2006 = $ 280

Platform Notes (Continued)

```
    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)
Memory running at the CPU supported memory speed 1600 MHz
```

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    -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
```

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

Base Portability Flags (Continued)

```
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
 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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias
```

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

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias
```

Peak Compiler Invocation

C benchmarks:
```
icc    -m64
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```
```
   450.soplex: icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

Fortran benchmarks:
```
ifort -m64
```

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

SPEC CFP2006 Result

Lenovo Group Limited

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$SPECfp_rate2006 = $ 286

$SPECfp_rate_base2006 = $ 280

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

Peak 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
 453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
  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
```

Peak Optimization Flags

C benchmarks:

```
    433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
              -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
              -auto-ilp32

    470.lbm: basepeak = yes

 482.sphinx3: -xCORE-AVX2 -prof-gen(pass 1) -ipo -O3 -no-prec-div
              -prof-use(pass 2) -unroll2
```

C++ benchmarks:

```
    444.namd: -xCORE-AVX2(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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
              -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
              -opt-malloc-options=3

    453.povray: -xCORE-AVX2(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:

Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(Intel Xeon E5-2603 v3, 1.60 GHz)

SPECfp_rate2006 = 286

SPECfp_rate_base2006 = 280

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

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

Peak Optimization Flags (Continued)

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -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 -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -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-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

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

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

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