



# SPEC® CFP2006 Result

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## Lenovo Group Limited

SPECfp®\_rate2006 = 406

Lenovo System x iDataPlex dx360 M4  
(Intel Xeon E5-2630L v2, 2.40 GHz)

SPECfp\_rate\_base2006 = 398

CPU2006 license: 9017

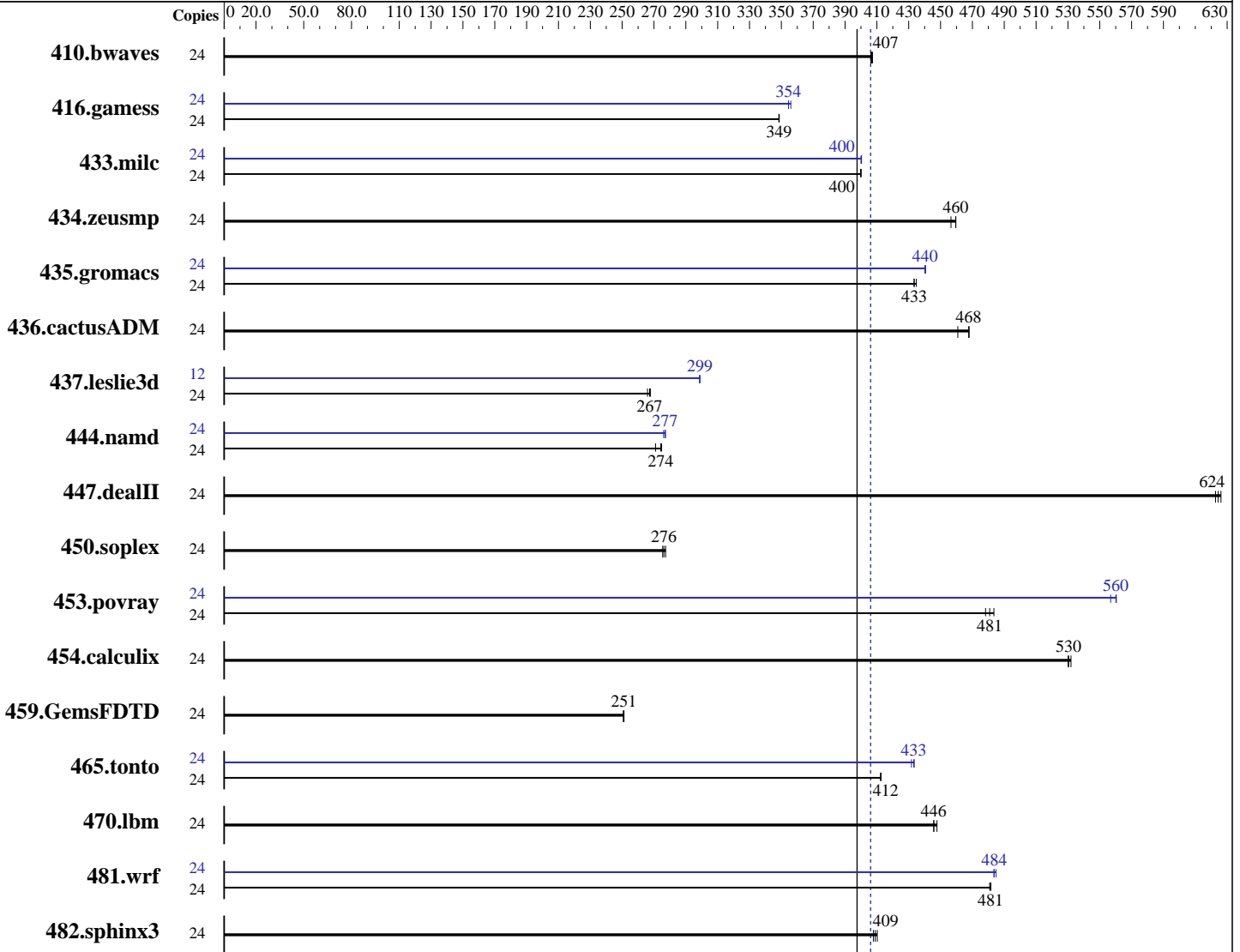
Test date: Nov-2014

Test sponsor: Lenovo Group Limited

Hardware Availability: Dec-2013

Tested by: IBM Corporation

Software Availability: Sep-2013



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### 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, 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

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### 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: No  
 File System: ext4

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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 PC3-14900R-13, ECC, running at 1600 MHz)  
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
Other Hardware: None

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

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24	803	406	801	407	<b>802</b>	<b>407</b>	24	803	406	801	407	<b>802</b>	<b>407</b>
416.gamess	24	1348	349	<b>1348</b>	<b>349</b>	1349	348	24	<b>1326</b>	<b>354</b>	1320	356	1326	354
433.milc	24	551	400	551	400	<b>551</b>	<b>400</b>	24	550	400	551	400	<b>550</b>	<b>400</b>
434.zeusmp	24	<b>475</b>	<b>460</b>	478	457	475	460	24	<b>475</b>	<b>460</b>	478	457	475	460
435.gromacs	24	394	435	395	433	<b>395</b>	<b>433</b>	24	389	440	<b>389</b>	<b>440</b>	389	441
436.cactusADM	24	613	468	622	461	<b>613</b>	<b>468</b>	24	613	468	622	461	<b>613</b>	<b>468</b>
437.leslie3d	24	<b>844</b>	<b>267</b>	843	268	848	266	12	<b>378</b>	<b>299</b>	378	299	377	299
444.namd	24	700	275	<b>702</b>	<b>274</b>	710	271	24	<b>695</b>	<b>277</b>	694	277	697	276
447.dealII	24	441	623	439	626	<b>440</b>	<b>624</b>	24	441	623	439	626	<b>440</b>	<b>624</b>
450.soplex	24	722	277	<b>725</b>	<b>276</b>	727	275	24	722	277	<b>725</b>	<b>276</b>	727	275
453.povray	24	<b>266</b>	<b>481</b>	264	484	267	478	24	228	560	<b>228</b>	<b>560</b>	229	557
454.calculix	24	372	532	<b>373</b>	<b>530</b>	374	530	24	372	532	<b>373</b>	<b>530</b>	374	530
459.GemsFDTD	24	<b>1014</b>	<b>251</b>	1016	251	1014	251	24	<b>1014</b>	<b>251</b>	1016	251	1014	251
465.tonto	24	573	412	572	413	<b>573</b>	<b>412</b>	24	545	433	<b>545</b>	<b>433</b>	547	432
470.lbm	24	736	448	740	446	<b>740</b>	<b>446</b>	24	736	448	740	446	<b>740</b>	<b>446</b>
481.wrf	24	558	481	557	482	<b>557</b>	<b>481</b>	24	554	484	<b>554</b>	<b>484</b>	553	485
482.sphinx3	24	1140	410	<b>1144</b>	<b>409</b>	1147	408	24	1140	410	<b>1144</b>	<b>409</b>	1147	408

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"  
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



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### Platform Notes

BIOS setting:

Operating Mode set to Maximum Performance  
Sysinfo program /home/SPECcpu-20140116-ic14.0/config/sysinfo.rev6874  
\$Rev: 6874 \$ \$Date:: 2013-11-20 #\$ 654bd3fcf53b06faef0efe54ed011998  
running on dx360M4 Thu Nov 27 09:56:59 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)
 24 "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      : 12
  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:      264642460 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 dx360M4 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 Nov 26 21:14
```

```
SPEC is set to: /home/SPECcpu-20140116-ic14.0
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/mapper/vg_td2-lv_home
                ext4      380G  174G  187G  49% /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.

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## Platform Notes (Continued)

BIOS IBM -[TDE139OUS-1.50]- 02/21/2014

Memory:

16x Samsung M393B2G70QH0-CMA 16 GB 2 rank 1866 MHz, configured at 1600 MHz

(End of data from sysinfo program)

## General Notes

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

LD\_LIBRARY\_PATH = "/home/SPECcpu-20140116-ic14.0/libs/32:/home/SPECcpu-20140116-ic14.0/libs/64:/home/SPECcpu-20140116-ic14.0/sh"

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

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

437.leslie3d: -DSPEC\_CPU\_LP64

444.namd: -DSPEC\_CPU\_LP64

447.dealII: -DSPEC\_CPU\_LP64

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## Base Portability Flags (Continued)

```

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:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

C++ benchmarks:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

Fortran benchmarks:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch

```

Benchmarks using both Fortran and C:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

## 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



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## Peak Optimization Flags

### C benchmarks:

433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

### C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(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) -opt-mem-layout-trans=3(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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

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## Peak Optimization Flags (Continued)

454.calculix: basepeak = yes

481.wrf: -xAVX -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-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>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Tue Dec 30 16:10:44 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 30 December 2014.