SPEC® CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

$SPECfp®_rate2006 = $ 435

$SPECfp_rate_base2006 = $ 426
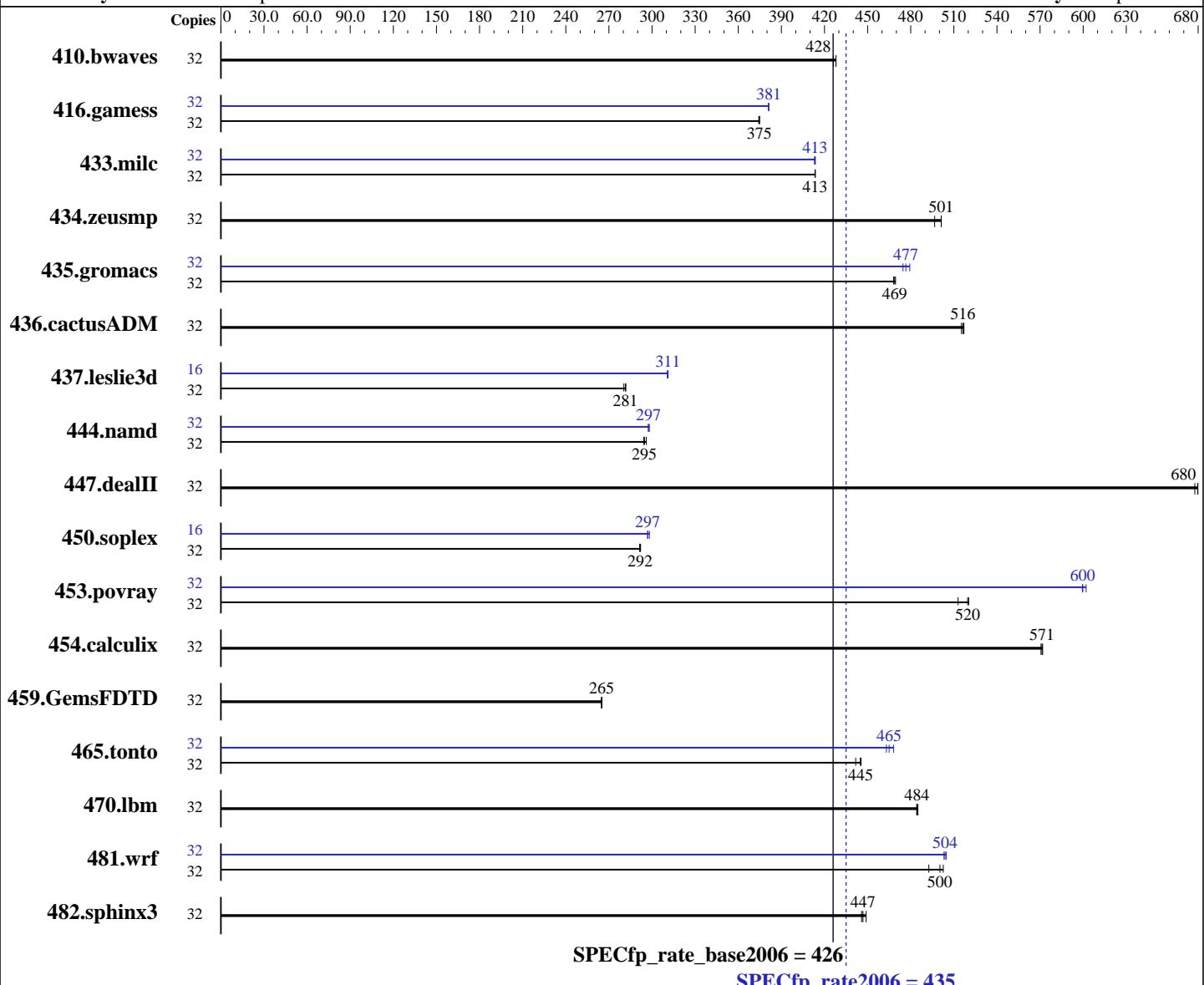
CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: IBM Corporation

Test date: Nov-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

Benchmark	Copies	Result
410.bwaves	32	428
416.gamess	32	381
	32	375
433.milc	32	413
	32	413
434.zeusmp	32	501
435.gromacs	32	477
	32	469
436.cactusADM	32	516
437.leslie3d	16	311
	32	281
444.namd	32	297
	32	295
447.dealII	32	680
450.soplex	16	297
	32	292
453.povray	32	600
	32	520
454.calculix	32	571
459.GemsFDTD	32	265
465.tonto	32	465
	32	445
470.lbm	32	484
481.wrf	32	504
	32	500
482.sphinx3	32	447

SPECfp_rate_base2006 = 426

SPECfp_rate2006 = 435

Hardware

CPU Name:	Intel Xeon E5-2628L v2
CPU Characteristics:	Intel Turbo Boost Technology up to 2.40 GHz
CPU MHz:	1900
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 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

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:	No
File System:	ext4

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

$SPECfp_rate2006 = $ 435

$SPECfp_rate_base2006 = $ 426

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

L3 Cache:	20 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 PC3-14900R-13, ECC, running at 1600 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 500 GB SATA, 7200 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	1016	428	**1016**	**428**	1020	426	32	1016	428	**1016**	**428**	1020	426
416.gamess	32	**1672**	**375**	1674	374	1672	375	32	1643	381	1645	381	**1644**	**381**
433.milc	32	711	413	710	414	**711**	**413**	32	711	413	**711**	**413**	710	414
434.zeusmp	32	**581**	**501**	586	497	581	501	32	**581**	**501**	586	497	581	501
435.gromacs	32	487	469	488	468	**487**	**469**	32	477	479	**479**	**477**	481	475
436.cactusADM	32	740	517	**741**	**516**	742	515	32	740	517	**741**	**516**	742	515
437.leslie3d	32	1068	282	**1069**	**281**	1073	280	16	484	311	483	311	**484**	**311**
444.namd	32	**871**	**295**	872	294	867	296	32	861	298	863	297	**863**	**297**
447.dealII	32	540	678	538	680	**539**	**680**	32	540	678	538	680	**539**	**680**
450.soplex	32	914	292	**915**	**292**	916	291	16	**449**	**297**	449	297	447	298
453.povray	32	332	513	**328**	**520**	327	520	32	284	599	**284**	**600**	283	602
454.calculix	32	**462**	**571**	462	572	463	571	32	**462**	**571**	462	572	463	571
459.GemsFDTD	32	1282	265	**1281**	**265**	1281	265	32	1282	265	**1281**	**265**	1281	265
465.tonto	32	**708**	**445**	707	445	713	442	32	673	468	**677**	**465**	680	463
470.lbm	32	**908**	**484**	908	484	907	485	32	**908**	**484**	908	484	907	485
481.wrf	32	**714**	**500**	711	503	726	493	32	708	505	710	503	**709**	**504**
482.sphinx3	32	1399	446	**1396**	**447**	1389	449	32	1399	446	**1396**	**447**	1389	449

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

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

SPECfp_rate2006 = 435

SPECfp_rate_base2006 = 426

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 Sat Nov  1 05:35:05 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 E5-2628L v2 @ 1.90GHz
      2 "physical id"s (chips)
      32 "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 : 8
      siblings  : 16
      physical 0: cores 0 1 2 3 4 5 6 7
      physical 1: cores 0 1 2 3 4 5 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       264641468 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 Oct 31 12:31

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.
```

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

$SPECfp_rate2006 = $ 435

$SPECfp_rate_base2006 = $ 426

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

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
```

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

$SPECfp\_rate2006 =$ 435

$SPECfp\_rate\_base2006 =$ 426

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

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 (except as noted below):
```
icpc   -m64
```

```
  450.soplex: icpc -m32
```

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

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

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

$SPECfp\_rate2006 =$ 435

$SPECfp\_rate\_base2006 =$ 426

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

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: -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: -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-malloc-options=3

    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:

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/

Page 6

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

Lenovo Group Limited

IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2628L v2, 1.90 GHz)

$SPECfp_rate2006 = $ 435

$SPECfp_rate_base2006 = $ 426

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

Test date: Nov-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

Peak Optimization Flags (Continued)

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

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

---

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

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Dec 3 10:29:55 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 2 December 2014.