Lenovo Group Limited
IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2640 v2, 2.00 GHz)

SPECfp®2006 = 78.4
SPECfp_base2006 = 75.6

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

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

Hardware

CPU Name: Intel Xeon E5-2640 v2
CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz: 2000
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

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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Lenovo Group Limited
IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2640 v2, 2.00 GHz)

**SPEC CFP2006 Result**

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

**L3 Cache:** 20 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:** 64-bit
**Peak Pointers:** 32/64-bit
**Other Software:** None

**Operating System Notes**
- Stack size set to unlimited using "ulimit -s unlimited"
- Zone reclaim mode enabled with:
  ```bash
echo 1 > /proc/sys/vm/zone_reclaim_mode
```
- Intel Idle Driver disabled with the following Linux kernel parameter in /etc/grub.conf:
  ```bash
  intel_idle.max_cstate=0
  ```

**Platform Notes**
- BIOS setting:
  ```bash
  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 Fri Oct 10 15:02:36 2014
  ```

---

**Results Table**

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<th>Seconds</th>
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</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"
Zone reclaim mode enabled with:
```bash
echo 1 > /proc/sys/vm/zone_reclaim_mode
```
Intel Idle Driver disabled with the following Linux kernel parameter in /etc/grub.conf:
```bash
intel_idle.max_cstate=0
```
Lenovo Group Limited
IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2640 v2, 2.00 GHz)

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

SPECFp2006 = 78.4
SPECFp_base2006 = 75.6

Platform Notes (Continued)

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 E5-2640 v2 @ 2.00GHz
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

From /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)
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 8 18:10

SPEC is set to: /home/SPECcpu-20140116-ic14.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg_td2-1v_home
ext4 380G 175G 186G 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 the hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS IBM -[TDE139OUS-1.50]- 02/21/2014
Memory:
16x Samsung M393B2G70QH0-CMA 16 GB 2 rank 1866 MHz, configured at 1600 MHz

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Lenovo Group Limited
IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2640 v2, 2.00 GHz)

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

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

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/SPECcpu-20140116-ic14.0/libs/32:/home/SPECcpu-20140116-ic14.0/libs/64:/home/SPECcpu-20140116-ic14.0/sh"
OMP_NUM_THREADS = "16"

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
  465.tonto: ~DSPEC_CPU_LP64

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Lenovo Group Limited
IBM System x iDataPlex dx360 M4
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CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: IBM Corporation

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

Base Portability Flags (Continued)

470.libm: -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:
433.milc: basepeak = yes

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Lenovo Group Limited
IBM System x iDataPlex dx360 M4
(Intel Xeon E5-2640 v2, 2.00 GHz)

SPECfp2006 = 78.4
SPECfp_base2006 = 75.6

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

Peak Optimization Flags (Continued)

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) -unroll14 -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) -unroll12
-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) -unroll12
-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 -unroll14

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

481.wrf: basepeak = yes
## SPEC CFP2006 Result

**Lenovo Group Limited**

**IBM System x iDataPlex dx360 M4**  
(Intel Xeon E5-2640 v2, 2.00 GHz)

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

The flags files that were used to format this result can be browsed at:
- [Intel ic14.0 official linux64.20140128.html](http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html)
- [IBM Platform Flags V1.2 IVB-C.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:
- [Intel ic14.0 official linux64.20140128.xml](http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml)
- [IBM Platform Flags V1.2 IVB-C.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.

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