SPEC® CFP2006 Result
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IBM Corporation

IBM System x iDataPlex dx360 M4 (Intel Xeon E5-2609)

$SPECfp^{®}2006 =$ 58.8
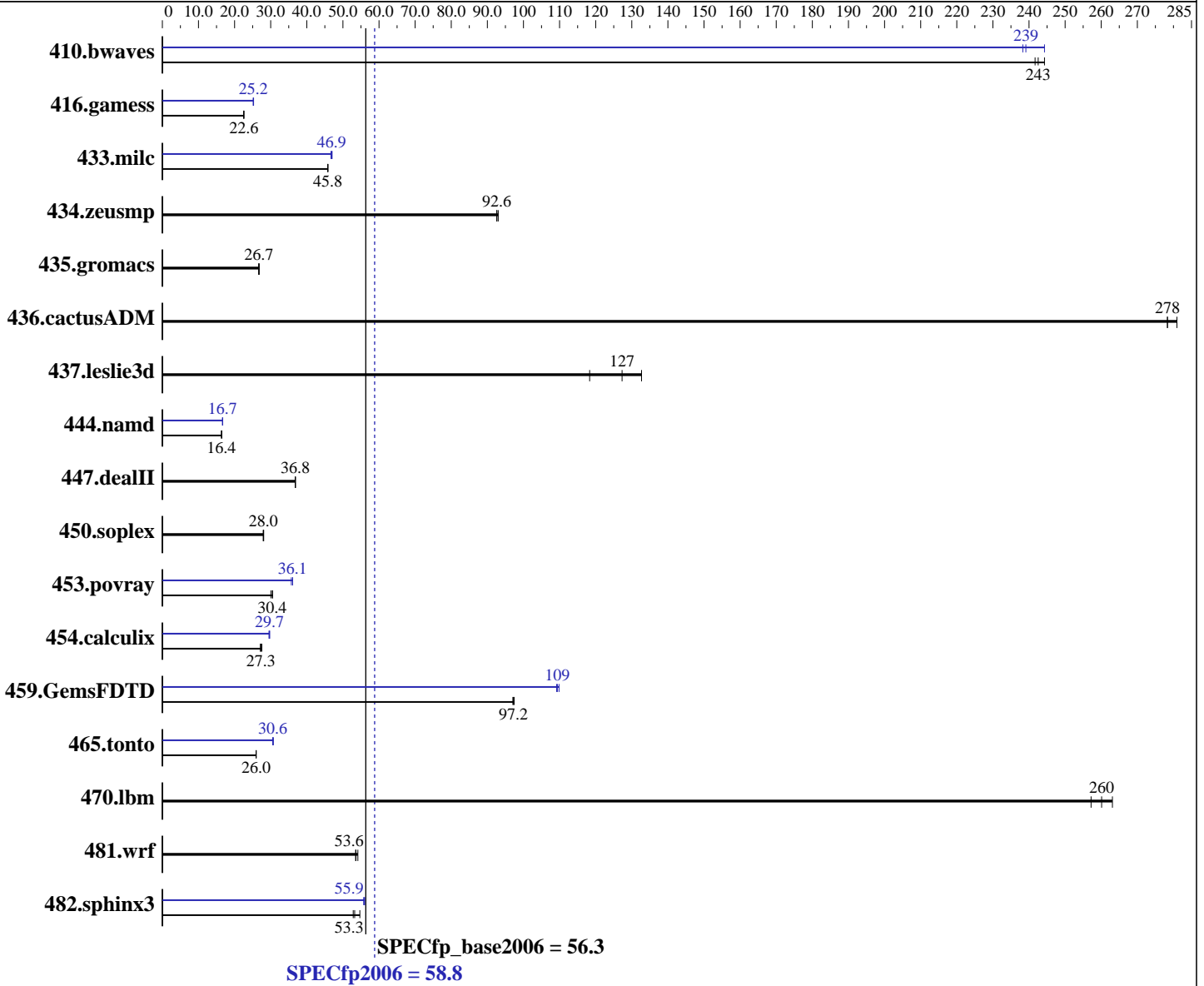
$SPECfp\_base2006 =$ 56.3

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Jun-2012
Hardware Availability: Mar-2012
Software Availability: Dec-2011

Benchmark	Value (blue)	Value (black)
410.bwaves	239	243
416.gamess	25.2	22.6
433.milc	46.9	45.8
434.zeusmp		92.6
435.gromacs		26.7
436.cactusADM		278
437.leslie3d		127
444.namd	16.7	16.4
447.dealII		36.8
450.soplex		28.0
453.povray	36.1	30.4
454.calculix	29.7	27.3
459.GemsFDTD	109	97.2
465.tonto	30.6	26.0
470.lbm		260
481.wrf		53.6
482.sphinx3	55.9	53.3

SPECfp_base2006 = 56.3
SPECfp2006 = 58.8

Hardware

CPU Name:	Intel Xeon E5-2609
CPU Characteristics:	
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	8 cores, 2 chips, 4 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 6.2 (Santiago)
	2.6.32-220.el6.x86_64
Compiler:	C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;
	Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4

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L3 Cache:	10 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1066 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 250 GB SATA, 7200 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	55.6	244	56.2	242	**56.0**	**243**	55.6	244	**56.8**	**239**	57.0	238
416.gamess	**867**	**22.6**	870	22.5	867	22.6	778	25.2	775	25.3	**776**	**25.2**
433.milc	200	45.8	200	45.8	**200**	**45.8**	197	46.7	195	47.0	**196**	**46.9**
434.zeusmp	98.2	92.6	97.8	93.0	**98.2**	**92.6**	98.2	92.6	97.8	93.0	**98.2**	**92.6**
435.gromacs	**267**	**26.7**	266	26.8	268	26.7	**267**	**26.7**	266	26.8	268	26.7
436.cactusADM	**42.9**	**278**	42.5	281	42.9	278	**42.9**	**278**	42.5	281	42.9	278
437.leslie3d	**73.8**	**127**	70.8	133	79.4	118	**73.8**	**127**	70.8	133	79.4	118
444.namd	489	16.4	489	16.4	**489**	**16.4**	**481**	**16.7**	481	16.7	481	16.7
447.dealII	**311**	**36.8**	310	36.9	311	36.8	**311**	**36.8**	310	36.9	311	36.8
450.soplex	299	27.9	297	28.1	**298**	**28.0**	299	27.9	297	28.1	**298**	**28.0**
453.povray	**175**	**30.4**	174	30.5	177	30.0	**147**	**36.1**	149	35.7	147	36.1
454.calculix	299	27.5	**302**	**27.3**	304	27.1	**278**	**29.7**	278	29.7	279	29.5
459.GemsFDTD	109	97.1	**109**	**97.2**	109	97.4	97.2	109	96.6	110	**97.0**	**109**
465.tonto	378	26.0	**379**	**26.0**	379	25.9	**321**	**30.6**	320	30.7	322	30.5
470.lbm	53.4	257	52.2	263	**52.8**	**260**	53.4	257	52.2	263	**52.8**	**260**
481.wrf	**208**	**53.6**	209	53.5	206	54.1	**208**	**53.6**	209	53.5	206	54.1
482.sphinx3	**366**	**53.3**	356	54.7	369	52.9	**349**	**55.9**	350	55.8	348	56.0

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
```

Platform Notes

```
BIOS Settings:
Operating Mode set to Maximum Performance
Sysinfo program /root/SPECcpu-v1.2/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ 8787f7622badcf24e01c368b1db4377c
running on tianden Sat Jun  9 04:38:32 2012

This section contains SUT (System Under Test) info as seen by
```

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Platform Notes (Continued)

```
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 E5-2609 0 @ 2.40GHz
      2 "physical id"s (chips)
      8 "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 : 4
      siblings  : 4
      physical 0: cores 0 1 2 3
      physical 1: cores 0 1 2 3
   cache size : 10240 KB

From /proc/meminfo
   MemTotal:       132096584 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.2 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux tianden 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011 x86_64
   x86_64 x86_64 GNU/Linux

run-level 3 Jun 7 15:36

SPEC is set to: /root/SPECcpu-v1.2
   Filesystem     Type     Size  Used Avail Use% Mounted on
   /dev/mapper/vg_tianden-lv_root
                  ext4     145G   61G   78G  44% /

(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 = "/root/SPECcpu-v1.2/libs/32:/root/SPECcpu-v1.2/libs/64"
OMP_NUM_THREADS = "8"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RHEL5.5
```

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General Notes (Continued)

```
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
```

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
      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 -static -parallel -opt-prefetch
-ansi-alias
```

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

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Base Optimization Flags (Continued)

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

Benchmarks using both Fortran and C:
```
-xAVX -ipo -O3 -no-prec-div -static -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: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
> `-no-prec-div(pass 2) -prof-use(pass 2) -static -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`

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Peak Optimization Flags (Continued)

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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel -static

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- -static

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

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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-SNB-C.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-SNB-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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