SPEC® CFP2006 Result
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IBM Corporation
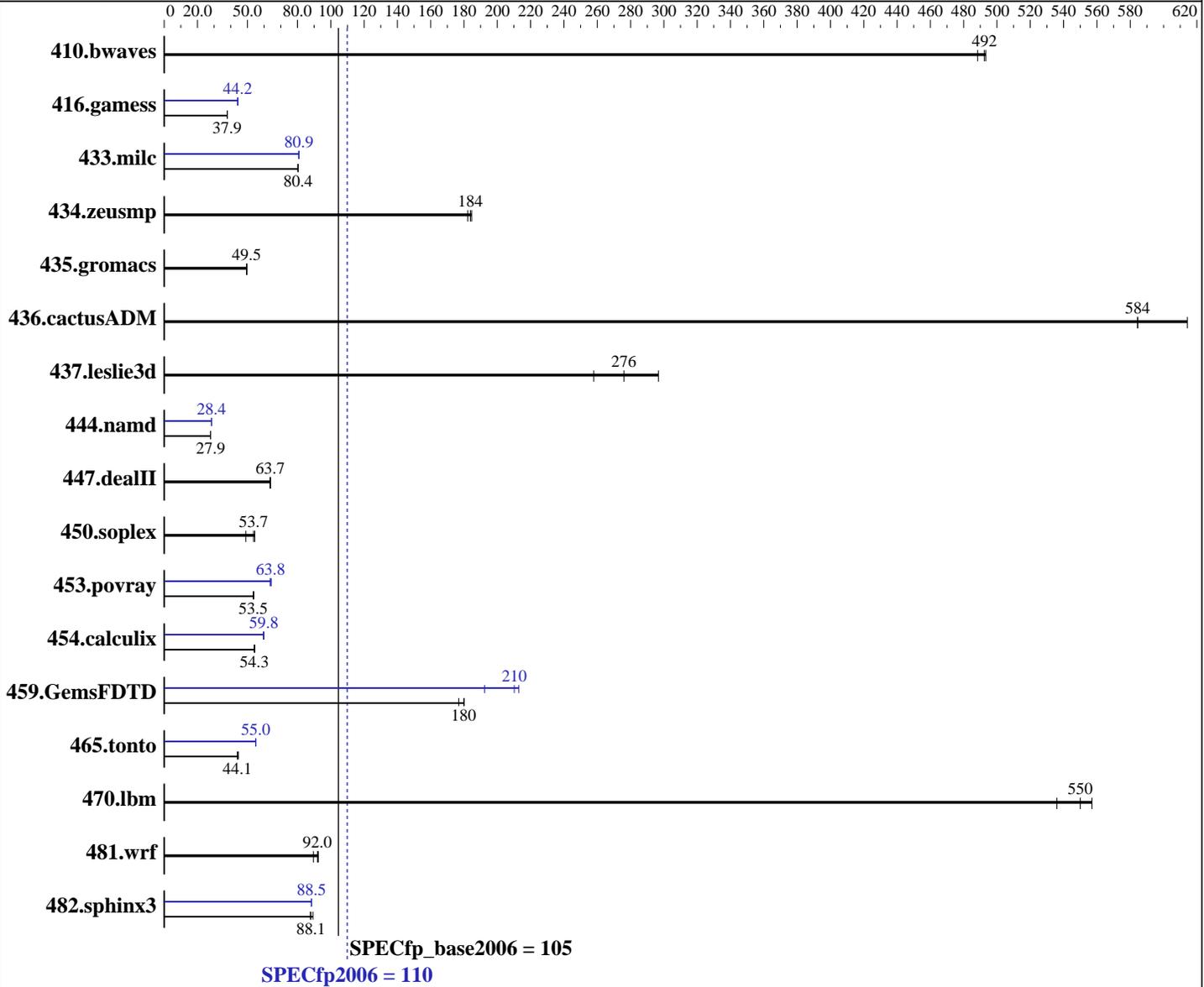
IBM System x3650 M4
(Intel Xeon E5-2667 v2, 3.30 GHz)

$SPECfp^{®}2006 = $ 110

$SPECfp_base2006 = $ 105

CPU2006 license: 11	**Test date:** Nov-2013
Test sponsor: IBM Corporation	**Hardware Availability:** Dec-2013
Tested by: IBM Corporation	**Software Availability:** Sep-2013

410.bwaves 492
416.gamess 44.2 / 37.9
433.milc 80.9 / 80.4
434.zeusmp 184
435.gromacs 49.5
436.cactusADM 584
437.leslie3d 276
444.namd 28.4 / 27.9
447.dealII 63.7
450.soplex 53.7
453.povray 63.8 / 53.5
454.calculix 59.8 / 54.3
459.GemsFDTD 210 / 180
465.tonto 55.0 / 44.1
470.lbm 550
481.wrf 92.0
482.sphinx3 88.5 / 88.1

SPECfp_base2006 = 105
SPECfp2006 = 110

Hardware

CPU Name:	Intel Xeon E5-2667 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 4.00 GHz
CPU MHz:	3300
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 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 6.4 (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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L3 Cache:	25 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0	Other Software:	None
Other Hardware:	None		

Results Table

	Base						Peak					
Benchmark	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	**27.6**	**492**	27.6	493	27.8	488	**27.6**	**492**	27.6	493	27.8	488
416.gamess	517	37.8	**517**	**37.9**	516	38.0	443	44.2	444	44.1	**443**	**44.2**
433.milc	114	80.3	114	80.4	**114**	**80.4**	**113**	**80.9**	113	80.9	114	80.8
434.zeusmp	**49.5**	**184**	49.3	185	49.9	182	**49.5**	**184**	49.3	185	49.9	182
435.gromacs	144	49.6	144	49.5	**144**	**49.5**	144	49.6	144	49.5	**144**	**49.5**
436.cactusADM	**20.4**	**584**	20.4	584	19.5	614	**20.4**	**584**	20.4	584	19.5	614
437.leslie3d	31.7	297	**34.1**	**276**	36.4	258	31.7	297	**34.1**	**276**	36.4	258
444.namd	288	27.9	**288**	**27.9**	288	27.9	282	28.4	**282**	**28.4**	282	28.4
447.dealII	180	63.7	180	63.7	**180**	**63.7**	180	63.7	180	63.7	**180**	**63.7**
450.soplex	**155**	**53.7**	170	49.0	153	54.4	**155**	**53.7**	170	49.0	153	54.4
453.povray	98.8	53.8	**99.5**	**53.5**	99.6	53.4	**83.3**	**63.8**	83.6	63.7	82.8	64.3
454.calculix	152	54.5	153	54.0	**152**	**54.3**	138	59.9	**138**	**59.8**	139	59.5
459.GemsFDTD	60.0	177	**59.0**	**180**	58.9	180	**50.5**	**210**	49.8	213	55.2	192
465.tonto	**223**	**44.1**	224	44.0	221	44.6	**179**	**54.9**	179	**55.0**	179	55.0
470.lbm	24.7	557	25.6	536	**25.0**	**550**	24.7	557	25.6	536	**25.0**	**550**
481.wrf	125	89.6	**121**	**92.0**	121	92.6	125	89.6	**121**	**92.0**	121	92.6
482.sphinx3	222	87.8	218	89.3	**221**	**88.1**	**220**	**88.5**	220	88.5	220	88.4

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 setting:
Operating Mode set to Maximum Performance
Hyper-Threading set to Disabled
Sysinfo program /home/SPECcpu-new/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on x3650M4 Fri Nov  8 15:09:21 2013

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 E5-2667 v2 @ 3.30GHz
      2 "physical id"s (chips)
      16 "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  : 8
      physical 0: cores 1 2 3 4 8 9 10 11
      physical 1: cores 1 2 3 4 8 9 10 11
   cache size : 25600 KB

From /proc/meminfo
   MemTotal:       264342648 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 x3650M4 2.6.32-358.18.1.el6.x86_64 #1 SMP Fri Aug 2 17:04:38 EDT 2013
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 8 15:07

SPEC is set to: /home/SPECcpu-new
   Filesystem      Type    Size  Used Avail Use% Mounted on
   /dev/mapper/vg_x3650m4-lv_home
                   ext4    313G  200G   97G  68% /home

Additional information from dmidecode:
  BIOS IBM -[TESTBUILD-1.50]- 08/09/2013
  Memory:
   8x Not Specified Not Specified
   16x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank

 (End of data from sysinfo program)
"Not Specified" memory information from dmidecode indicates unused DIMM slots.
The BIOS IBM -[TESTBUILD-1.50] is equivalent to production version [VVE134TUS-1.51]
```

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General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/SPECcpu-new/libs/32:/home/SPECcpu-new/libs/64:/home/SPECcpu-new/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
      470.lbm: -DSPEC_CPU_LP64
       481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
    482.sphinx3: -DSPEC_CPU_LP64
```

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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: `-xAVX(pass 2)` `-prof-gen(pass 1)` `-ipo(pass 2)` `-O3(pass 2)`
> `-no-prec-div(pass 2)` `-prof-use(pass 2)` `-auto-ilp32`
> `-ansi-alias`

> 470.lbm: basepeak = yes

> 482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias`
> `-parallel`

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Peak Optimization Flags (Continued)

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) `-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: `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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.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-A.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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