



SPEC[®] CFP2006 Result

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IBM Corporation

IBM System x3550 M4
(Intel Xeon E5-2697 v2, 2.70 GHz)

SPECfp[®]2006 = 103

SPECfp_base2006 = 98.4

CPU2006 license: 11

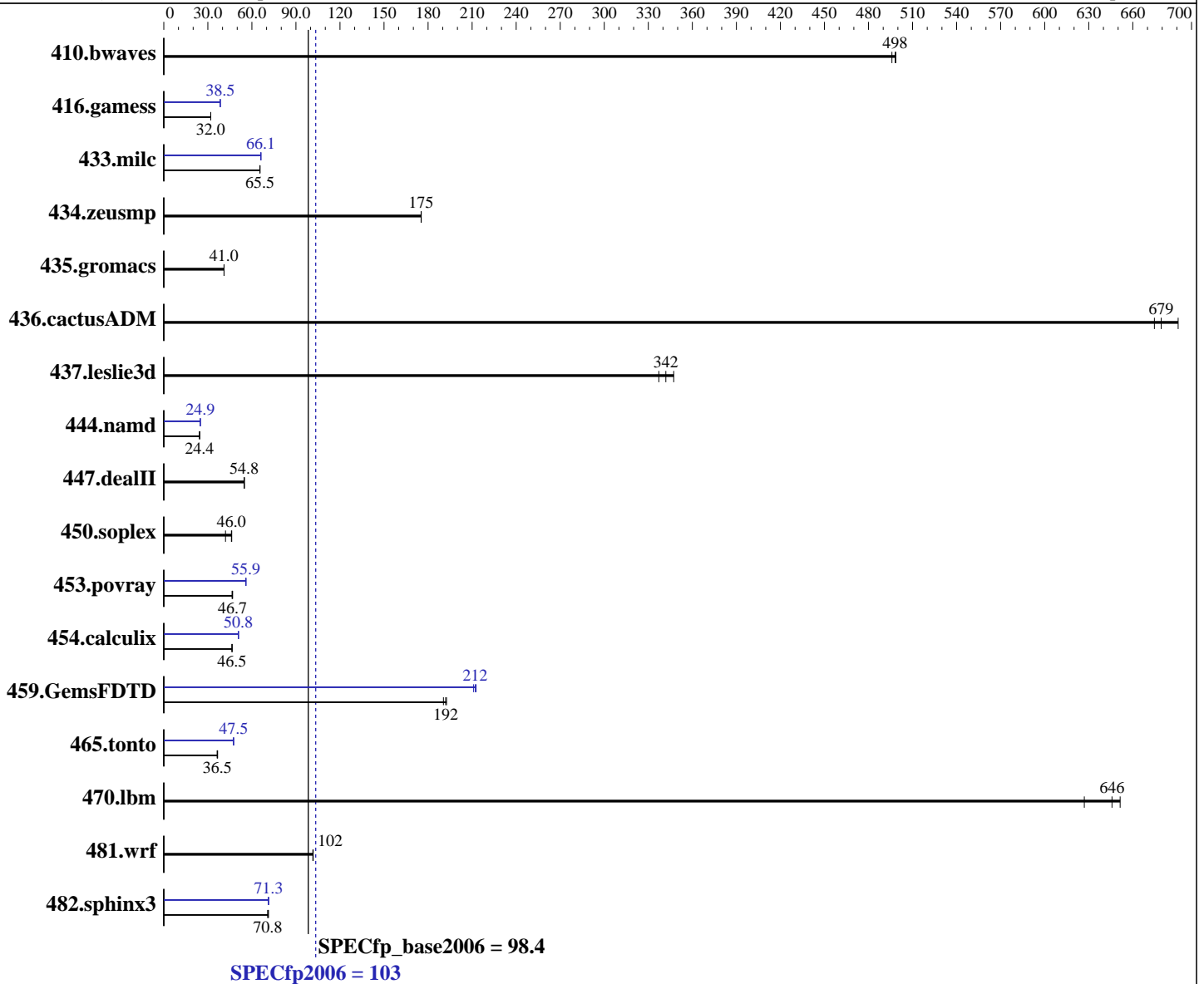
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Sep-2014

Hardware Availability: Dec-2013

Software Availability: Sep-2013



Hardware

CPU Name: Intel Xeon E5-2697 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 CPU MHz: 2700
 FPU: Integrated
 CPU(s) enabled: 24 cores, 2 chips, 12 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

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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: Yes
 File System: ext4

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem: 1 x 400 GB SAS SSD, RAID 0
Other Hardware: None

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

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	27.3	499	27.3	498	27.4	496	27.3	499	27.3	498	27.4	496
416.gamess	612	32.0	612	32.0	612	32.0	509	38.4	509	38.5	509	38.5
433.milc	140	65.5	140	65.4	140	65.5	139	66.1	139	66.1	139	66.2
434.zeusmp	51.9	175	51.9	175	51.9	175	51.9	175	51.9	175	51.9	175
435.gromacs	174	41.0	174	41.0	174	41.0	174	41.0	174	41.0	174	41.0
436.cactusADM	17.3	691	17.7	675	17.6	679	17.3	691	17.7	675	17.6	679
437.leslie3d	27.1	347	27.9	337	27.5	342	27.1	347	27.9	337	27.5	342
444.namd	329	24.4	329	24.4	329	24.4	323	24.9	323	24.9	323	24.9
447.dealII	209	54.8	209	54.8	209	54.8	209	54.8	209	54.8	209	54.8
450.soplex	181	46.0	180	46.3	198	42.0	181	46.0	180	46.3	198	42.0
453.povray	113	46.9	114	46.5	114	46.7	95.0	56.0	95.2	55.9	95.2	55.9
454.calculix	177	46.5	178	46.5	178	46.5	162	50.9	162	50.8	162	50.8
459.GemsFDTD	55.7	190	55.1	193	55.3	192	49.9	213	50.3	211	50.0	212
465.tonto	268	36.7	269	36.5	271	36.3	207	47.5	208	47.4	207	47.6
470.lbm	21.1	651	21.3	646	21.9	627	21.1	651	21.3	646	21.9	627
481.wrf	110	102	110	102	110	102	110	102	110	102	110	102
482.sphinx3	275	70.8	275	70.8	273	71.3	273	71.4	274	71.1	273	71.3

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
Intel Idle Driver disabled with the following Linux kernel parameter in /etc/grub.conf:
intel_idle.max_cstate=0

Platform Notes

BIOS setting:
Operating Mode set to Maximum Performance
Hyper-Threading set to Disable
Sysinfo program /home/SPECcpu-20140116-ic14.0/config/sysinfo.rev6818
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191
running on x3550M4 Sun Sep 7 00:05:46 2014

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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 E5-2697 v2 @ 2.70GHz
 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    : 12
  siblings     : 12
  physical 0:  cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 1:  cores 0 1 2 3 4 5 8 9 10 11 12 13
cache size     : 30720 KB
```

```
From /proc/meminfo
MemTotal:      264464532 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 x3550M4 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 Sep 3 12:01
```

```
SPEC is set to: /home/SPECcpu-20140116-ic14.0
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/mapper/vg_x3550m4-lv_home
                ext4      312G  208G   89G  71% /home
```

```
Additional information from dmidecode:
BIOS IBM  -[D7E139YUS-1.70]- 05/13/2014
Memory:
 8x Not Specified Not Specified
16x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank
```

(End of data from sysinfo program)



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General Notes

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

KMP_AFFINITY = "granularity=fine,compact,0,1"

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 = "24"

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.deallI: -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.dealIII: 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-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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