SPEC® CFP2006 Result

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IBM Corporation
IBM System x3550 M5

$SPECfp^®\_rate2006 = 942$
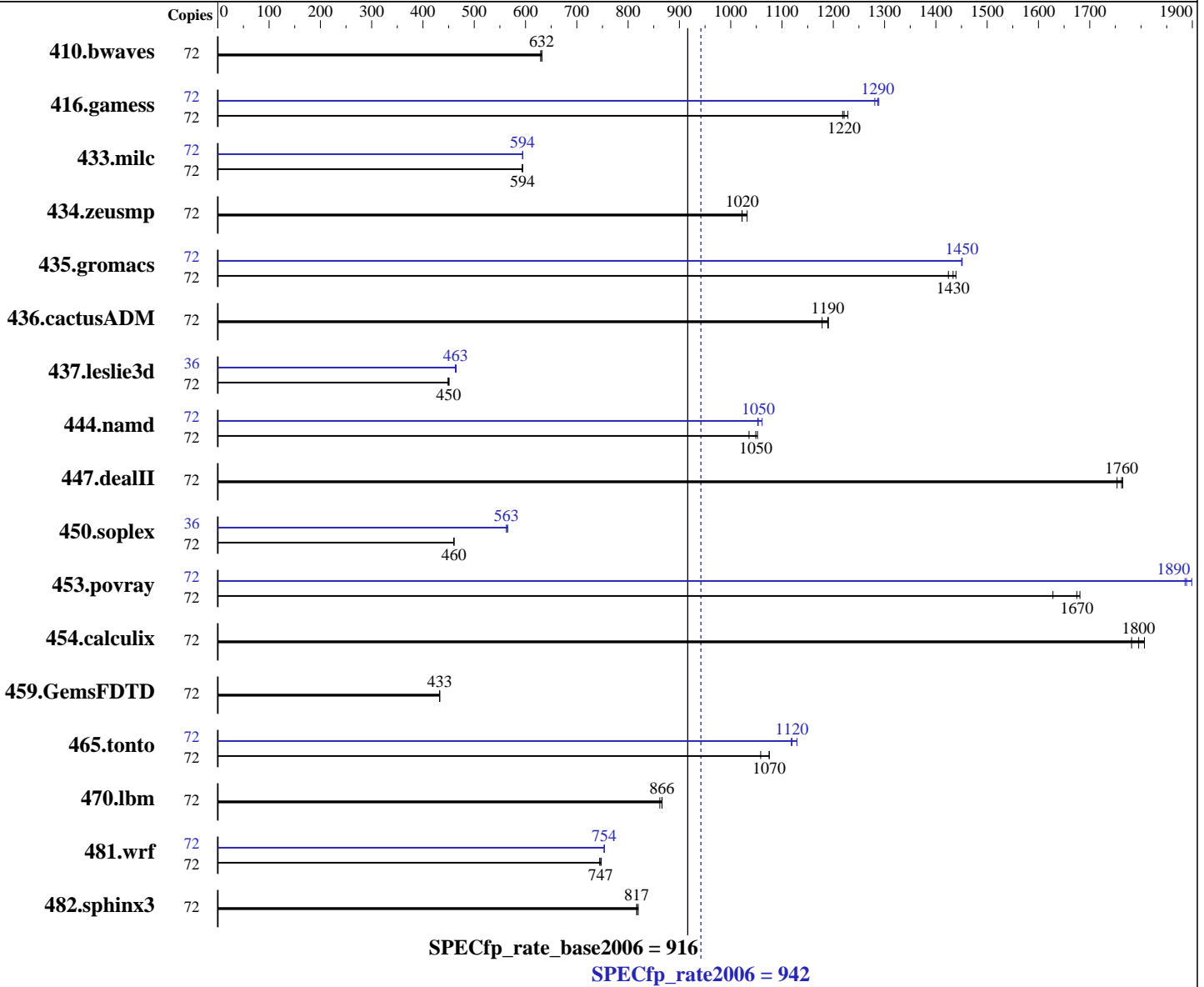
$SPECfp\_rate\_base2006 = 916$

CPU2006 license: 11　　　　　　　　　　　　　　　　　**Test date:** Aug-2014
Test sponsor: IBM Corporation　　　　　　　　　　　**Hardware Availability:** Oct-2014
Tested by: IBM Corporation　　　　　　　　　　　　**Software Availability:** Nov-2013

Benchmark	Copies	Result
410.bwaves	72	632
416.gamess	72	1290
416.gamess	72	1220
433.milc	72	594
433.milc	72	594
434.zeusmp	72	1020
435.gromacs	72	1450
435.gromacs	72	1430
436.cactusADM	72	1190
437.leslie3d	36	463
437.leslie3d	72	450
444.namd	72	1050
444.namd	72	1050
447.dealII	72	1760
450.soplex	36	563
450.soplex	72	460
453.povray	72	1890
453.povray	72	1670
454.calculix	72	1800
459.GemsFDTD	72	433
465.tonto	72	1120
465.tonto	72	1070
470.lbm	72	866
481.wrf	72	754
481.wrf	72	747
482.sphinx3	72	817

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Hardware
CPU Name: Intel Xeon E5-2699 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 36 cores, 2 chips, 18 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 6.5 (Santiago)
2.6.32-431.el6.x86_64
Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel: No
File System: ext4
Continued on next page

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L3 Cache:	45 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem:	1 x 300 GB SAS
Other Hardware:	None

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

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	72	1555	629	**1549**	**632**	1549	632	72	1555	629	**1549**	**632**	1549	632
416.gamess	72	1157	1220	1148	1230	**1154**	**1220**	72	1101	1280	**1096**	**1290**	1094	1290
433.milc	72	**1113**	**594**	1112	594	1113	594	72	1112	595	1112	594	**1112**	**594**
434.zeusmp	72	635	1030	641	1020	**641**	**1020**	72	635	1030	641	1020	**641**	**1020**
435.gromacs	72	361	1420	357	1440	**359**	**1430**	72	**354**	**1450**	354	1450	354	1450
436.cactusADM	72	**723**	**1190**	723	1190	730	1180	72	**723**	**1190**	723	1190	730	1180
437.leslie3d	72	**1503**	**450**	1501	451	1508	449	36	728	465	**730**	**463**	731	463
444.namd	72	549	1050	558	1040	**551**	**1050**	72	**548**	**1050**	544	1060	549	1050
447.dealII	72	467	1760	**467**	**1760**	470	1750	72	467	1760	**467**	**1760**	470	1750
450.soplex	72	1303	461	1305	460	**1304**	**460**	36	534	563	531	565	**533**	**563**
453.povray	72	**229**	**1670**	228	1680	235	1630	72	203	1890	**203**	**1890**	202	1900
454.calculix	72	333	1780	**331**	**1800**	329	1810	72	333	1780	**331**	**1800**	329	1810
459.GemsFDTD	72	**1766**	**433**	1767	432	1765	433	72	**1766**	**433**	1767	432	1765	433
465.tonto	72	**659**	**1070**	669	1060	659	1080	72	634	1120	627	1130	**633**	**1120**
470.lbm	72	1148	862	**1142**	**866**	1142	866	72	1148	862	**1142**	**866**	1142	866
481.wrf	72	**1077**	**747**	1076	748	1080	744	72	1067	754	**1067**	**754**	1068	753
482.sphinx3	72	1718	817	1712	820	**1718**	**817**	72	1718	817	1712	820	**1718**	**817**

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"

Platform Notes

Sysinfo program /root/SPECCpu2014Sep01/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Fri Aug 29 17:04:21 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 E5-2699 v3 @ 2.30GHz
      2 "physical id"s (chips)
      72 "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 : 18
      siblings  : 36
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 23040 KB

From /proc/meminfo
   MemTotal:       264150104 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux localhost.localdomain 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54
   EST 2013 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 29 16:59

SPEC is set to: /root/SPECCpu2014Sep01
   Filesystem                     Type  Size  Used Avail Use% Mounted on
   /dev/mapper/VolGroup-lv_root ext4  271G   20G  238G   8% /

Additional information from dmidecode:
  BIOS IBM -[TBE101V-1.00]- 08/25/2014
  Memory:
   14x Hynix 484D4134324752374D4652344E2D54462020 16 GB 2133 MHz 2 rank
   2x Hynix 484D4134324752374D4652344E2D54465431 16 GB 2133 MHz 2 rank
   8x NO DIMM Unknown

(End of data from sysinfo program)
```

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General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/SPECCpu2014Sep01/libs/32:/root/SPECCpu2014Sep01/libs/64:/root/SPECCpu2014Sep01/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
    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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -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
```

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
```

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Peak Portability Flags (Continued)

```
   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: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2(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:

```
   410.bwaves: basepeak = yes

   416.gamess: -xCORE-AVX2(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
```

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Peak Optimization Flags (Continued)

      437.leslie3d: `-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch`

   459.GemsFDTD: `basepeak = yes`

        465.tonto: `-xCORE-AVX2(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: `-xCORE-AVX2(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: `-xCORE-AVX2 -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-HSW-B.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-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-HSW-B.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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