SPEC® CFP2006 Result
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Supermicro

SuperServer 6028R-WTR
(X10DRW-i , Intel Xeon E5-2697 v4)

$SPECfp^®\_rate2006 =$ 1040

SPECfp_rate_base2006 = 1010

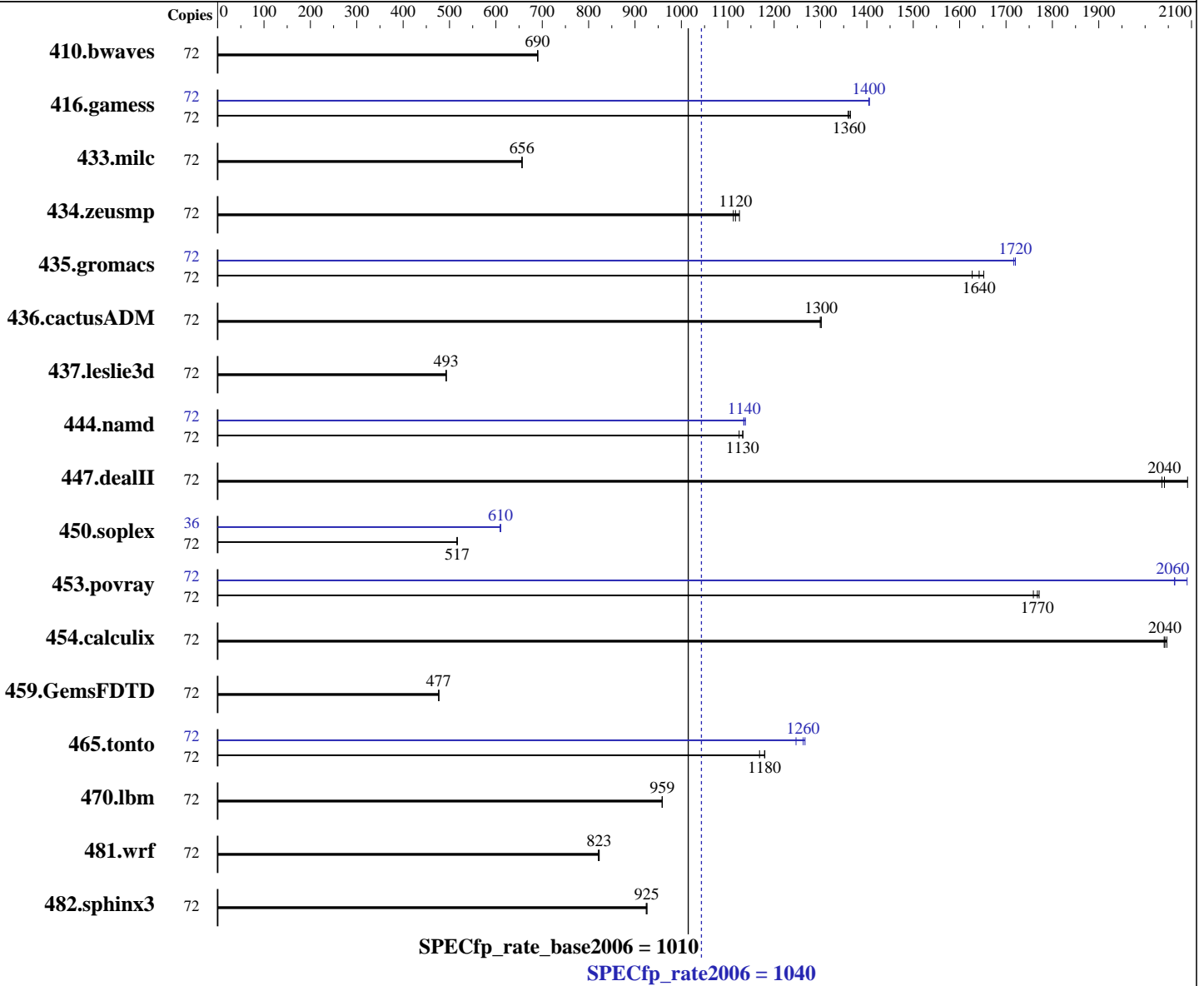|	
CPU2006 license: 001176	**Test date:** Mar-2016
Test sponsor: Supermicro	**Hardware Availability:** Mar-2016
Tested by: Supermicro	**Software Availability:** Sep-2015

Copies

Benchmark	Copies	Result
410.bwaves	72	690
416.gamess	72	1400
416.gamess	72	1360
433.milc	72	656
434.zeusmp	72	1120
435.gromacs	72	1720
435.gromacs	72	1640
436.cactusADM	72	1300
437.leslie3d	72	493
444.namd	72	1140
444.namd	72	1130
447.dealII	72	2040
450.soplex	36	610
450.soplex	72	517
453.povray	72	2060
453.povray	72	1770
454.calculix	72	2040
459.GemsFDTD	72	477
465.tonto	72	1260
465.tonto	72	1180
470.lbm	72	959
481.wrf	72	823
482.sphinx3	72	925

SPECfp_rate_base2006 = 1010

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Hardware

CPU Name:	Intel Xeon E5-2697 v4
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 7.2, Kernel 3.10.0-327.el7.x86_64
Compiler:	C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi-user)

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L3 Cache:	45 MB I+D on chip per chip	Base Pointers:	32/64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)	Other Software:	None
Disk Subsystem:	1 x 200 GB SATA III SSD		
Other Hardware:	None		

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	72	1419	690	**1418**	**690**	1417	691	72	1419	690	**1418**	**690**	1417	691
416.gamess	72	**1035**	**1360**	1033	1360	1037	1360	72	1003	1410	1004	1400	**1004**	**1400**
433.milc	72	1007	656	**1007**	**656**	1006	657	72	1007	656	**1007**	**656**	1006	657
434.zeusmp	72	**587**	**1120**	582	1130	589	1110	72	**587**	**1120**	582	1130	589	1110
435.gromacs	72	**313**	**1640**	311	1650	316	1630	72	**299**	**1720**	299	1720	299	1720
436.cactusADM	72	**661**	**1300**	662	1300	661	1300	72	**661**	**1300**	662	1300	661	1300
437.leslie3d	72	**1374**	**493**	1372	493	1374	492	72	**1374**	**493**	1372	493	1374	492
444.namd	72	510	1130	513	1120	**510**	**1130**	72	509	1130	**509**	**1140**	507	1140
447.dealII	72	394	2090	**403**	**2040**	405	2040	72	394	2090	**403**	**2040**	405	2040
450.soplex	72	**1162**	**517**	1162	517	1164	516	36	**492**	**610**	493	609	492	610
453.povray	72	**217**	**1770**	216	1770	218	1760	72	186	2060	**186**	**2060**	183	2090
454.calculix	72	**291**	**2040**	290	2050	291	2040	72	**291**	**2040**	290	2050	291	2040
459.GemsFDTD	72	1603	477	**1602**	**477**	1602	477	72	1603	477	**1602**	**477**	1602	477
465.tonto	72	**601**	**1180**	606	1170	600	1180	72	**561**	**1260**	568	1250	559	1270
470.lbm	72	1032	959	**1032**	**959**	1032	959	72	1032	959	**1032**	**959**	1032	959
481.wrf	72	980	821	**978**	**823**	978	823	72	980	821	**978**	**823**	978	823
482.sphinx3	72	**1516**	**925**	1519	924	1516	926	72	**1516**	**925**	1519	924	1516	926

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

BIOS Settings:
Early Snoop = Disable
COD Enable = Enable

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Hardware Availability: Mar-2016
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Platform Notes (Continued)

```
Enforce POR = Disabled
Memory Frequency = 2400
Sysinfo program /usr/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on X10DRW-01 Sat Mar  5 17:19:52 2016

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 v4 @ 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:       264034372 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.2 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.2"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

uname -a:
   Linux X10DRW-01 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 4 17:11

SPEC is set to: /usr/cpu2006
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       xfs   183G  5.3G  178G   3% /
Additional information from dmidecode:
```
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Platform Notes (Continued)

```
   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
   hardware, firmware, and the "DMTF SMBIOS" standard.

  BIOS American Megatrends Inc. 2.0 12/17/2015
  Memory:
   16x Hynix Semiconductor HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz

 (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/usr/cpu2006/libs/32:/usr/cpu2006/libs/64:/usr/cpu2006/sh"

 Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
 memory using RedHat EL 7.1
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/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
```

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Base Portability Flags (Continued)

```
     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:
```
-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 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

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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
     450.soplex: -D_FILE_OFFSET_BITS=64
    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
```

Peak Optimization Flags

C benchmarks:

```
       433.milc: basepeak = yes

        470.lbm: basepeak = yes

    482.sphinx3: basepeak = yes
```

C++ benchmarks:

```
     444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
               -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
               -par-num-threads=1(pass 1) -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:threadsafe(pass 1)
               -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
               -par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
               -prof-use(pass 2) -opt-malloc-options=3

    453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
               -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
               -par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
               -prof-use(pass 2) -unroll4 -ansi-alias
```

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Peak Optimization Flags (Continued)

Fortran benchmarks:

    410.bwaves: basepeak = yes

    416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
           -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
           -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
           -inline-level=0 -scalar-rep-

    434.zeusmp: basepeak = yes

    437.leslie3d: basepeak = yes

  459.GemsFDTD: basepeak = yes

      465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
           -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
           -par-num-threads=1(pass 1) -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:threadsafe(pass 1)
           -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
           -par-num-threads=1(pass 1) -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: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revH.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revH.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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