SPEC® CFP2006 Result
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Supermicro

SuperServer 6028R-WTRT
(X10DRW-iT , Intel Xeon E5-2660 v3)

$SPECfp^{®}2006 =$ 113
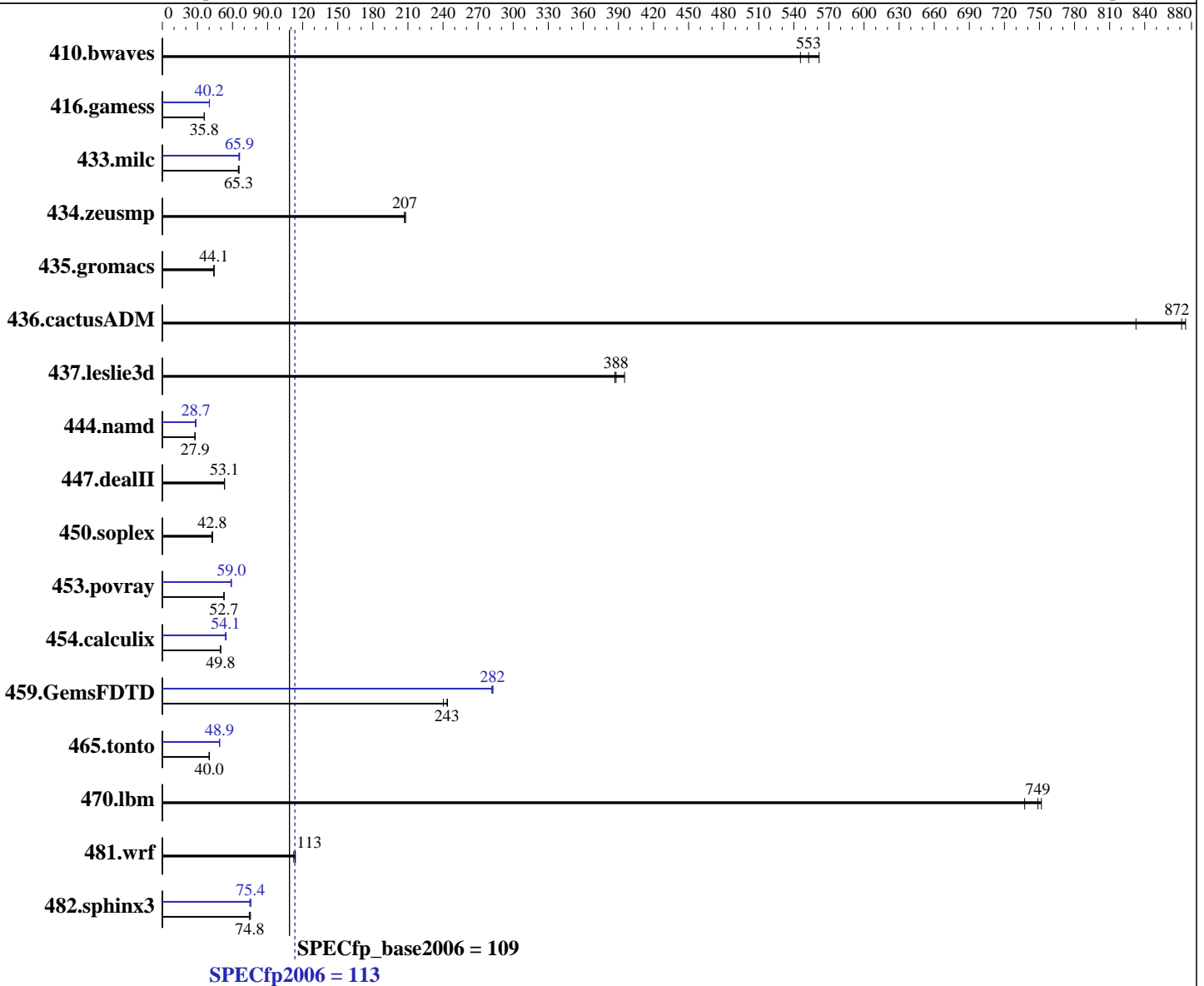
$SPECfp\_base2006 =$ 109

CPU2006 license: 001176
Test sponsor: Supermicro
Tested by: Supermicro

Test date: Dec-2014
Hardware Availability: Sep-2014
Software Availability: Sep-2014

Graph scale: 0 30.0 60.0 90.0 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630 660 690 720 750 780 810 840 880

- 410.bwaves: 553
- 416.gamess: 40.2 / 35.8
- 433.milc: 65.9 / 65.3
- 434.zeusmp: 207
- 435.gromacs: 44.1
- 436.cactusADM: 872
- 437.leslie3d: 388
- 444.namd: 28.7 / 27.9
- 447.dealII: 53.1
- 450.soplex: 42.8
- 453.povray: 59.0 / 52.7
- 454.calculix: 54.1 / 49.8
- 459.GemsFDTD: 282 / 243
- 465.tonto: 48.9 / 40.0
- 470.lbm: 749
- 481.wrf: 113
- 482.sphinx3: 75.4 / 74.8

SPECfp_base2006 = 109
SPECfp2006 = 113

Hardware

CPU Name: Intel Xeon E5-2660 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz: 2600
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 1,2 chip
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 7.0, Kernel 3.10.0-123.8.1.el7.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: Yes
File System: xfs
System State: Run level 3 (multi-user)

Continued on next page

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L3 Cache:	25 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Other Software:	None
Disk Subsystem:	1 x 400 GB SATA III SSD		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24.9	546	**24.6**	**553**	24.2	562	24.9	546	**24.6**	**553**	24.2	562
416.gamess	**546**	**35.8**	545	35.9	547	35.8	**487**	**40.2**	487	40.2	487	40.2
433.milc	140	65.6	**141**	**65.3**	141	65.0	139	66.0	**139**	**65.9**	140	65.4
434.zeusmp	**43.9**	**207**	43.8	208	44.0	207	**43.9**	**207**	43.8	208	44.0	207
435.gromacs	161	44.2	**162**	**44.1**	162	44.1	161	44.2	**162**	**44.1**	162	44.1
436.cactusADM	14.4	833	13.7	875	**13.7**	**872**	14.4	833	13.7	875	**13.7**	**872**
437.leslie3d	24.3	387	**24.2**	**388**	23.8	395	24.3	387	**24.2**	**388**	23.8	395
444.namd	287	27.9	288	27.9	**287**	**27.9**	284	28.2	279	28.7	**280**	**28.7**
447.dealII	215	53.2	**215**	**53.1**	216	53.1	215	53.2	**215**	**53.1**	216	53.1
450.soplex	**195**	**42.8**	195	42.8	197	42.4	**195**	**42.8**	195	42.8	197	42.4
453.povray	**101**	**52.7**	101	52.6	101	52.8	90.7	58.6	90.1	59.1	**90.2**	**59.0**
454.calculix	166	49.7	166	49.8	**166**	**49.8**	**153**	**54.1**	153	54.0	151	54.6
459.GemsFDTD	44.1	240	**43.6**	**243**	43.5	244	37.7	282	**37.6**	**282**	37.5	283
465.tonto	**246**	**40.0**	244	40.3	246	40.0	201	48.8	201	49.0	**201**	**48.9**
470.lbm	18.3	752	**18.4**	**749**	18.6	737	18.3	752	**18.4**	**749**	18.6	737
481.wrf	99.4	112	98.2	114	**98.4**	**113**	99.4	112	98.2	114	**98.4**	**113**
482.sphinx3	262	74.3	259	75.4	**261**	**74.8**	257	75.7	**258**	**75.4**	261	74.8

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"
```

Platform Notes

```
BIOS Settings:
Enforce POR = Disabled
Early Snoop = Disabled
Memory Frequency = 2133
Sysinfo program /usr/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Sun Dec  7 21:07:52 2014

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
```

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Tested by: Supermicro	**Software Availability:** Sep-2014

Platform Notes (Continued)

```
     http://www.spec.org/cpu2006/Docs/config.html#sysinfo

  From /proc/cpuinfo
     model name : Intel(R) Xeon(R) CPU E5-2660 v3 @ 2.60GHz
        2 "physical id"s (chips)
        40 "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 : 10
        siblings  : 20
        physical 0: cores 0 1 2 3 4 8 9 10 11 12
        physical 1: cores 0 1 2 3 4 8 9 10 11 12
     cache size : 25600 KB

  From /proc/meminfo
     MemTotal:       263865432 kB
     HugePages_Total:        0
     Hugepagesize:        2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.0 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VERSION_ID="7.0"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
        ANSI_COLOR="0;31"
        CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
     redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
     system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

  uname -a:
     Linux localhost.localdomain 3.10.0-123.8.1.el7.x86_64 #1 SMP Mon Aug 11
     13:37:49 EDT 2014 x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Dec 7 21:06

  SPEC is set to: /usr/cpu2006
     Filesystem            Type  Size  Used Avail Use% Mounted on
     /dev/mapper/rhel-root xfs   314G  9.1G  305G   3% /
  Additional information from dmidecode:

     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. 1.0b 10/29/2014
     Memory:
```

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Platform Notes (Continued)

```
     4x Micron (date:14/30) 36ASF2G72PZ-2G1A2 16 GB 2 rank 2133 MHz
     8x Micron (date:14/31) 36ASF2G72PZ-2G1A2 16 GB 2 rank 2133 MHz
     4x Micron (date:14/32) 36ASF2G72PZ-2G1A2 16 GB 2 rank 2133 MHz

   (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 = "/usr/cpu2006/libs/32:/usr/cpu2006/libs/64:/usr/cpu2006/sh"
OMP_NUM_THREADS = "20"

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/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
```

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Base Portability Flags (Continued)

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

C++ benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

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

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

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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) -prof-use(pass 2)`
`-auto-ilp32 -ansi-alias`

470.lbm: `basepeak = yes`

482.sphinx3: `-xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias`
`-parallel`

C++ benchmarks:

444.namd: `-xCORE-AVX2(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: `-xCORE-AVX2(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: `-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`

437.leslie3d: `basepeak = yes`

459.GemsFDTD: `-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 -opt-prefetch -parallel`

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)`
`-inline-calloc -opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

435.gromacs: `basepeak = yes`

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Peak Optimization Flags (Continued)

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revE.xml

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