SPEC® CFP2006 Result

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Supermicro

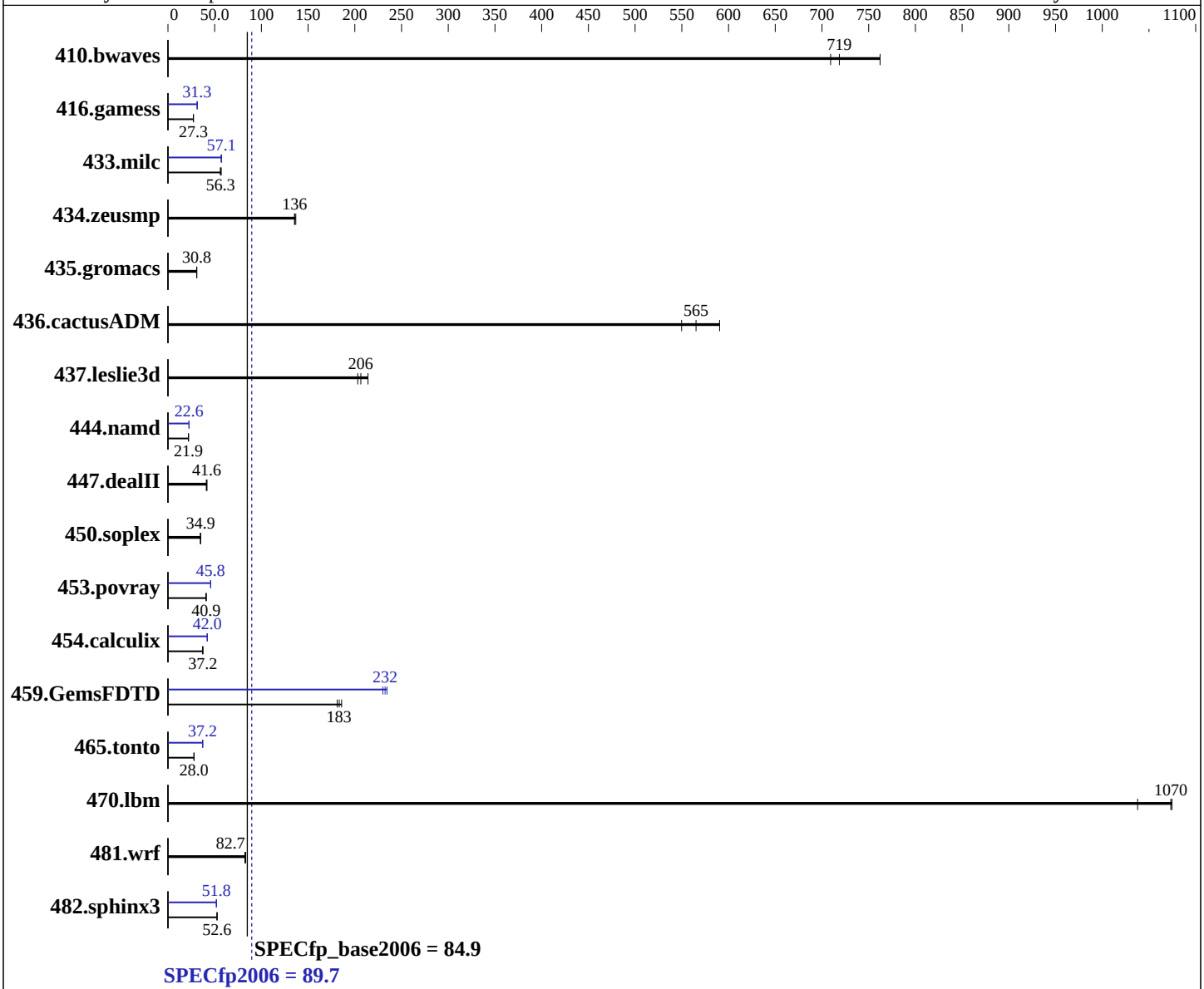
SuperServer 2048U-RTR4
(X10QRH+ , Intel Xeon E5-4620 v3)

SPECfp®2006 = 89.7

SPECfp_base2006 = 84.9

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

Test date: Jun-2015
Hardware Availability: Jun-2015
Software Availability: Oct-2014



Hardware

CPU Name:	Intel Xeon E5-4620 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 2.60 GHz
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	40 cores, 4 chips, 10 cores/chip
CPU(s) orderable:	1,2,4 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:	SUSE Linux Enterprise Server 12, Kernel 3.12.28-4-default
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:	ext4
System State:	Run level 3 (multi-user)

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L3 Cache: 25 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)
Disk Subsystem: 1 x 512 GB SATA III, SSD
Other Hardware: None

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	19.2	709	17.8	762	**18.9**	**719**	19.2	709	17.8	762	**18.9**	**719**
416.gamess	**718**	**27.3**	718	27.3	720	27.2	626	31.3	626	31.3	**626**	**31.3**
433.milc	161	57.0	**163**	**56.3**	163	56.2	**161**	**57.1**	161	56.9	160	57.3
434.zeusmp	66.5	137	67.1	136	**67.1**	**136**	66.5	137	67.1	136	**67.1**	**136**
435.gromacs	**232**	**30.8**	231	30.9	232	30.7	**232**	**30.8**	231	30.9	232	30.7
436.cactusADM	21.7	550	**21.1**	**565**	20.2	590	21.7	550	**21.1**	**565**	20.2	590
437.leslie3d	43.9	214	46.3	203	**45.5**	**206**	43.9	214	46.3	203	**45.5**	**206**
444.namd	**366**	**21.9**	366	21.9	366	21.9	**356**	**22.6**	355	22.6	356	22.5
447.dealII	**275**	**41.6**	275	41.6	279	41.0	**275**	**41.6**	275	41.6	279	41.0
450.soplex	238	35.0	**239**	**34.9**	240	34.8	238	35.0	**239**	**34.9**	240	34.8
453.povray	**130**	**40.9**	131	40.7	130	41.0	117	45.5	**116**	**45.8**	116	45.8
454.calculix	**222**	**37.2**	221	37.4	222	37.2	196	42.0	196	42.1	**196**	**42.0**
459.GemsFDTD	58.6	181	57.1	186	**57.9**	**183**	**45.7**	**232**	46.1	230	45.3	234
465.tonto	355	27.7	351	28.1	**352**	**28.0**	264	37.2	265	37.1	**265**	**37.2**
470.lbm	**12.8**	**1070**	12.8	1070	13.2	1040	**12.8**	**1070**	12.8	1070	13.2	1040
481.wrf	134	83.2	136	82.4	**135**	**82.7**	134	83.2	136	82.4	**135**	**82.7**
482.sphinx3	**371**	**52.6**	371	52.6	371	52.5	375	52.0	**376**	**51.8**	376	51.8

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:
Hyper-Threading (ALL) = Disable
COD Enable = Disable
Early Snoop = Disable
Enforce POR = Disabled
Sysinfo program /home/SPEC2K6/SPEC2006-V12/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on 21-234 Mon Jun 22 02:58:25 2015
```

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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 E5-4620 v3 @ 2.00GHz
      4 "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  : 10
      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
      physical 2: cores 0 1 2 3 4 8 9 10 11 12
      physical 3: cores 0 1 2 3 4 8 9 10 11 12
   cache size : 25600 KB

From /proc/meminfo
   MemTotal:       529336776 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 0
      # This file is deprecated and will be removed in a future service pack or
      release.
      # Please check /etc/os-release for details about this release.
   os-release:
      NAME="SLES"
      VERSION="12"
      VERSION_ID="12"
      PRETTY_NAME="SUSE Linux Enterprise Server 12"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12"

uname -a:
   Linux 21-234 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014 (9879bd4)
   x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Jun 22 02:49

SPEC is set to: /home/SPEC2K6/SPEC2006-V12
   Filesystem     Type  Size  Used Avail Use% Mounted on
```

Continued on next page

Platform Notes (Continued)

```
    /dev/sda3      ext4  458G  7.2G  450G   2% /home
 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. 1.00 06/01/2015
   Memory:
    16x NO DIMM NO DIMM
    1x Samsung(data:13/44) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    1x Samsung(data:13/48) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    3x Samsung(data:13/51) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    2x Samsung(data:14/13) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    1x Samsung(data:14/16) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    5x Samsung(data:14/17) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    1x Samsung(data:14/25) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    14x Samsung(data:14/26) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 MHz
    4x Samsung(data:14/47) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at
    1866 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,0,1"
 LD_LIBRARY_PATH = "/home/SPEC2K6/SPEC2006-V12/libs/32:/home/SPEC2K6/SPEC2006-V12/libs/64:/home/SPEC2K6/SPEC2006-V12/sh"
 OMP_NUM_THREADS = "40"

  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
```

Continued on next page

Base Compiler Invocation (Continued)

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

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

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:

Continued on next page

Peak Optimization Flags (Continued)

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

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-revG.20141230.00.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-revG.20141230.00.xml

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