# SPEC® CFP2006 Result

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## Supermicro

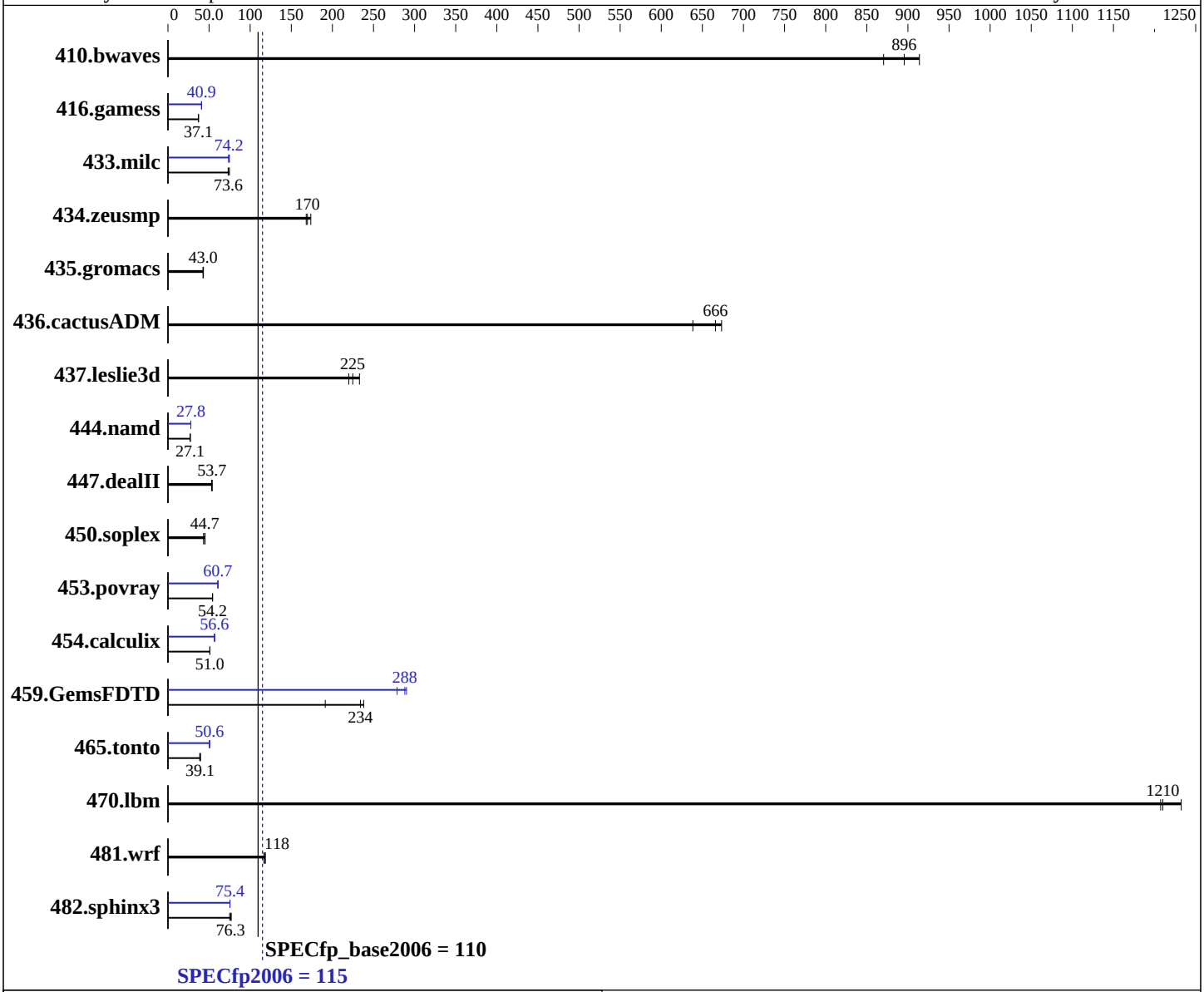
SuperServer 2048U-RTR4
(X10QRH+ , Intel Xeon E5-4627 v3)

SPECfp®2006 = 115

SPECfp_base2006 = 110

**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 E5-4627 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.20 GHz |
| CPU MHz: | 2600 |
| 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)
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 | **15.2** | **896** | 14.9 | 914 | 15.6 | 870 | **15.2** | **896** | 14.9 | 914 | 15.6 | 870 |
| 416.gamess | 530 | 36.9 | 527 | 37.2 | **527** | **37.1** | 482 | 40.6 | 478 | 41.0 | **479** | **40.9** |
| 433.milc | 125 | 73.2 | **125** | **73.6** | 123 | 74.8 | 123 | 74.8 | **124** | **74.2** | 125 | 73.7 |
| 434.zeusmp | **53.6** | **170** | 52.4 | 174 | 54.1 | 168 | **53.6** | **170** | 52.4 | 174 | 54.1 | 168 |
| 435.gromacs | **166** | **43.0** | 168 | 42.6 | 165 | 43.1 | **166** | **43.0** | 168 | 42.6 | 165 | 43.1 |
| 436.cactusADM | 18.7 | 638 | 17.7 | 673 | **17.9** | **666** | 18.7 | 638 | 17.7 | 673 | **17.9** | **666** |
| 437.leslie3d | 42.7 | 220 | 40.4 | 233 | **41.8** | **225** | 42.7 | 220 | 40.4 | 233 | **41.8** | **225** |
| 444.namd | **296** | **27.1** | 297 | 27.0 | 296 | 27.1 | 288 | 27.8 | **288** | **27.8** | 288 | 27.8 |
| 447.dealII | **213** | **53.7** | 213 | 53.7 | 216 | 53.0 | **213** | **53.7** | 213 | 53.7 | 216 | 53.0 |
| 450.soplex | 193 | 43.2 | 185 | 45.2 | **187** | **44.7** | 193 | 43.2 | 185 | 45.2 | **187** | **44.7** |
| 453.povray | 98.2 | 54.2 | **98.1** | **54.2** | 98.0 | 54.3 | 87.8 | 60.6 | **87.7** | **60.7** | 87.3 | 61.0 |
| 454.calculix | 161 | 51.1 | **162** | **51.0** | 162 | 50.9 | **146** | **56.6** | 145 | 57.1 | 146 | 56.6 |
| 459.GemsFDTD | 44.6 | 238 | 55.5 | 191 | **45.3** | **234** | **36.8** | **288** | 36.6 | 290 | 38.1 | 279 |
| 465.tonto | 255 | 38.6 | 248 | 39.6 | **251** | **39.1** | 195 | 50.4 | **194** | **50.6** | 194 | 50.7 |
| 470.lbm | 11.4 | 1210 | **11.4** | **1210** | 11.1 | 1230 | 11.4 | 1210 | **11.4** | **1210** | 11.1 | 1230 |
| 481.wrf | 94.4 | 118 | **94.5** | **118** | 95.8 | 117 | 94.4 | 118 | **94.5** | **118** | 95.8 | 117 |
| 482.sphinx3 | 253 | 77.0 | 260 | 75.0 | **255** | **76.3** | **259** | **75.4** | 258 | 75.6 | 259 | 75.3 |

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"
```

## Platform Notes

```
BIOS Settings:
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 Thu Jun 18 08:38:15 2015

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

Continued on next page

## Platform Notes (Continued)

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

    From /proc/cpuinfo
       model name : Intel(R) Xeon(R) CPU E5-4627 v3 @ 2.60GHz
          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 18 03:07

    SPEC is set to: /home/SPEC2K6/SPEC2006-V12
       Filesystem     Type  Size  Used Avail Use% Mounted on
       /dev/sda3      ext4  458G  8.8G  448G   2% /home
    Additional information from dmidecode:
```

Continued on next page

## 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. 1.00 06/01/2015
    Memory:
     16x NO DIMM NO DIMM
     1x Samsung(data:13/44) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     1x Samsung(data:13/48) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     3x Samsung(data:13/51) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     2x Samsung(data:14/13) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     1x Samsung(data:14/16) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     5x Samsung(data:14/17) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     1x Samsung(data:14/25) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     14x Samsung(data:14/26) M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
     4x Samsung(data:14/47) M393A2G40DB0-CPB 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,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
```

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

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## Peak Compiler Invocation (Continued)

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:

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

Continued on next page

# Peak Optimization Flags (Continued)

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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