# SPEC® CFP2006 Result

## Supermicro

SuperServer 6028R-TR
(X10DRi , Intel Xeon E5-2697 v4)

$SPECfp^{®}2006 =$ 127

$SPECfp\_base2006 =$ 119

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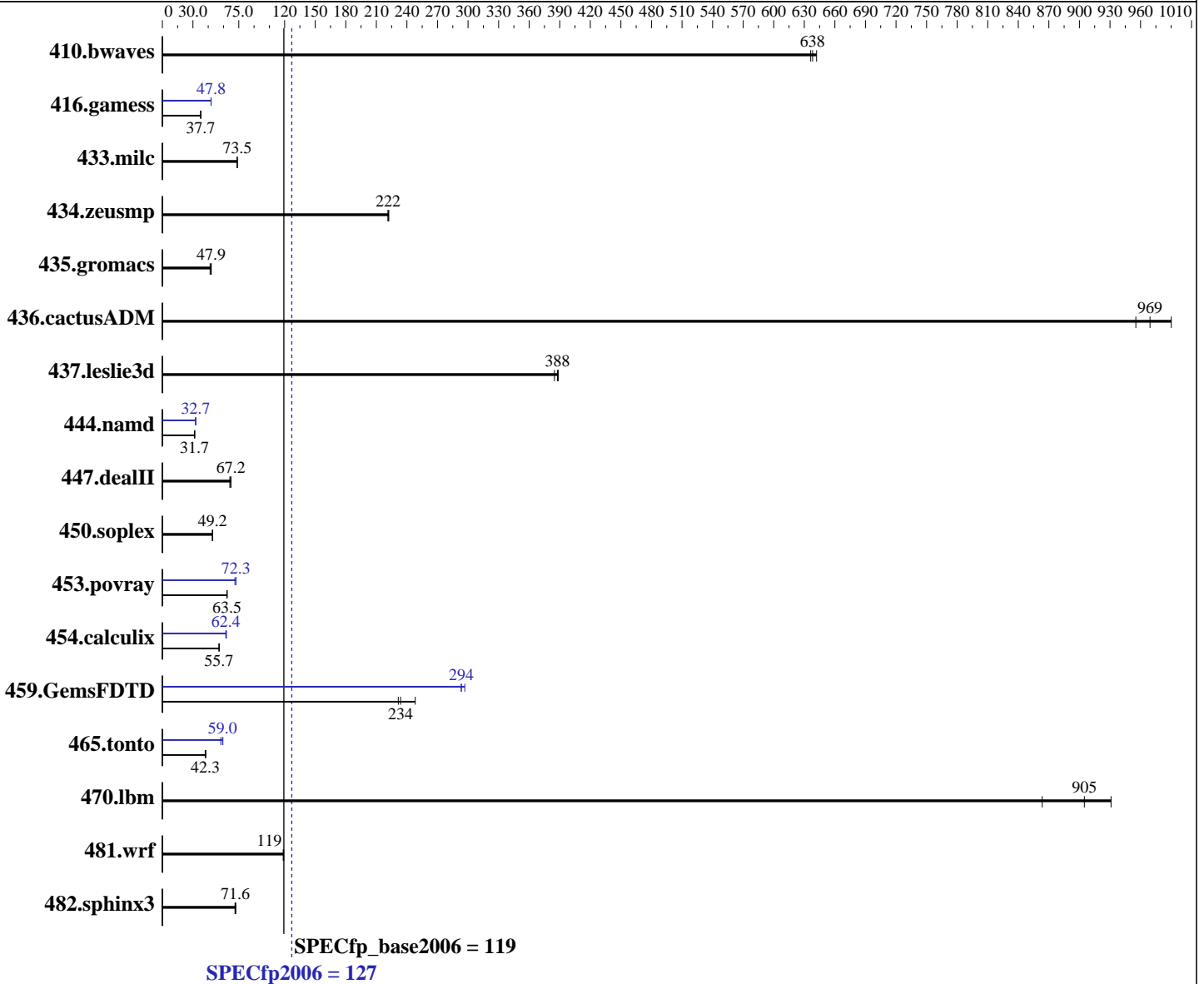**Test sponsor:** Supermicro
**Tested by:** Supermicro

**Test date:** Mar-2016
**Hardware Availability:** Mar-2016
**Software Availability:** Sep-2015



Benchmark results:

| Benchmark | peak | base |
|---|---|---|
| 410.bwaves | | 638 |
| 416.gamess | 47.8 | 37.7 |
| 433.milc | | 73.5 |
| 434.zeusmp | | 222 |
| 435.gromacs | | 47.9 |
| 436.cactusADM | | 969 |
| 437.leslie3d | | 388 |
| 444.namd | 32.7 | 31.7 |
| 447.dealII | | 67.2 |
| 450.soplex | | 49.2 |
| 453.povray | 72.3 | 63.5 |
| 454.calculix | 62.4 | 55.7 |
| 459.GemsFDTD | 294 | 234 |
| 465.tonto | 59.0 | 42.3 |
| 470.lbm | | 905 |
| 481.wrf | | 119 |
| 482.sphinx3 | | 71.6 |

SPECfp_base2006 = 119
SPECfp2006 = 127

## 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 |
| 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: | SUSE Linux Enterprise Server 12 SP1, Kernel 3.12.49-11-default |
| 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: | Yes |
| File System: | ext4 |
| System State: | Run level 3 (multi-user) |

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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 PC4-2400P-R) |
| Disk Subsystem: | 1 x 1000 GB SATA III, 7200 RPM |
| 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 | 21.2 | 642 | **21.3** | **638** | 21.4 | 636 | 21.2 | 642 | **21.3** | **638** | 21.4 | 636 |
| 416.gamess | **520** | **37.7** | 520 | 37.7 | 520 | 37.7 | 410 | 47.7 | **409** | **47.8** | 409 | 47.9 |
| 433.milc | 125 | 73.6 | **125** | **73.5** | 125 | 73.4 | 125 | 73.6 | **125** | **73.5** | 125 | 73.4 |
| 434.zeusmp | 41.1 | 221 | **41.1** | **222** | 40.9 | 222 | 41.1 | 221 | **41.1** | **222** | 40.9 | 222 |
| 435.gromacs | 149 | 47.9 | 152 | 46.8 | **149** | **47.9** | 149 | 47.9 | 152 | 46.8 | **149** | **47.9** |
| 436.cactusADM | 12.5 | 955 | **12.3** | **969** | 12.1 | 990 | 12.5 | 955 | **12.3** | **969** | 12.1 | 990 |
| 437.leslie3d | **24.2** | **388** | 24.4 | 385 | 24.2 | 389 | **24.2** | **388** | 24.4 | 385 | 24.2 | 389 |
| 444.namd | 253 | 31.7 | **253** | **31.7** | 253 | 31.7 | **245** | **32.7** | 245 | 32.7 | 246 | 32.6 |
| 447.dealII | **170** | **67.2** | 170 | 67.2 | 173 | 66.2 | **170** | **67.2** | 170 | 67.2 | 173 | 66.2 |
| 450.soplex | 170 | 49.1 | 169 | 49.3 | **169** | **49.2** | 170 | 49.1 | 169 | 49.3 | **169** | **49.2** |
| 453.povray | 83.9 | 63.4 | **83.8** | **63.5** | 83.7 | 63.5 | 74.7 | 71.2 | **73.6** | **72.3** | 73.6 | 72.3 |
| 454.calculix | **148** | **55.7** | 148 | 55.6 | 148 | 55.7 | 132 | 62.4 | **132** | **62.4** | 131 | 62.9 |
| 459.GemsFDTD | 42.8 | 248 | 45.8 | 232 | **45.4** | **234** | 35.7 | 297 | 36.2 | 293 | **36.1** | **294** |
| 465.tonto | 234 | 42.0 | **232** | **42.3** | 231 | 42.6 | 172 | 57.3 | 166 | 59.4 | **167** | **59.0** |
| 470.lbm | 15.9 | 863 | **15.2** | **905** | 14.8 | 931 | 15.9 | 863 | **15.2** | **905** | 14.8 | 931 |
| 481.wrf | 94.2 | 119 | **94.0** | **119** | 93.8 | 119 | 94.2 | 119 | **94.0** | **119** | 93.8 | 119 |
| 482.sphinx3 | **272** | **71.6** | 273 | 71.3 | 270 | 72.1 | **272** | **71.6** | 273 | 71.3 | 270 | 72.1 |

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
Home Dir Snoop with IVT- Style OSB = Disable
Enforce POR = Disabled
Hyper-Threading (ALL) = Disable
Sysinfo program /home/SPEC2K6/SPEC2006-V12/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on 160-223 Sat Mar 26 00:22:19 2016
```

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$SPECfp\_base2006 =$     119

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

**Test date:** Mar-2016
**Hardware Availability:** Mar-2016
**Software Availability:** Sep-2015

## 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 E5-2697 v4 @ 2.30GHz
      2 "physical id"s (chips)
      36 "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  : 18
      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 : 46080 KB

From /proc/meminfo
   MemTotal:       264566672 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12 SP1

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 1
      # 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-SP1"
      VERSION_ID="12.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
   Linux 160-223 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
   (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Mar 25 19:33

SPEC is set to: /home/SPEC2K6/SPEC2006-V12
   Filesystem      Type   Size   Used Avail Use% Mounted on
   /dev/sda3       ext4   905G   23G  882G   3% /home
Additional information from dmidecode:
```

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| | | | |
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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 12/28/2015
  Memory:
   16x Samsung M393A2G40DB1-CRC 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:
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 = "36"

 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
```

## 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

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**Tested by:** Supermicro

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# Base Portability Flags (Continued)

```
    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
```

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## Peak Portability Flags

Same as Base Portability Flags

## 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) -prof-use(pass 2) -fno-alias
        -auto-ilp32

    447.dealII: basepeak = yes

    450.soplex: basepeak = yes

    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) -prof-use(pass 2) -unroll4
        -ansi-alias

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: -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 -opt-prefetch -parallel

    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) -inline-calloc

![spec logo]

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# Peak Optimization Flags (Continued)

465.tonto (continued):
```
-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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revH.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-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revH.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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