



# SPEC<sup>®</sup> CFP2006 Result

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## Supermicro

SuperServer 6028R-TR  
(X10DRi , Intel Xeon E5-2643 v4)

SPECfp<sup>®</sup>2006 = 123

SPECfp\_base2006 = 119

CPU2006 license: 001176

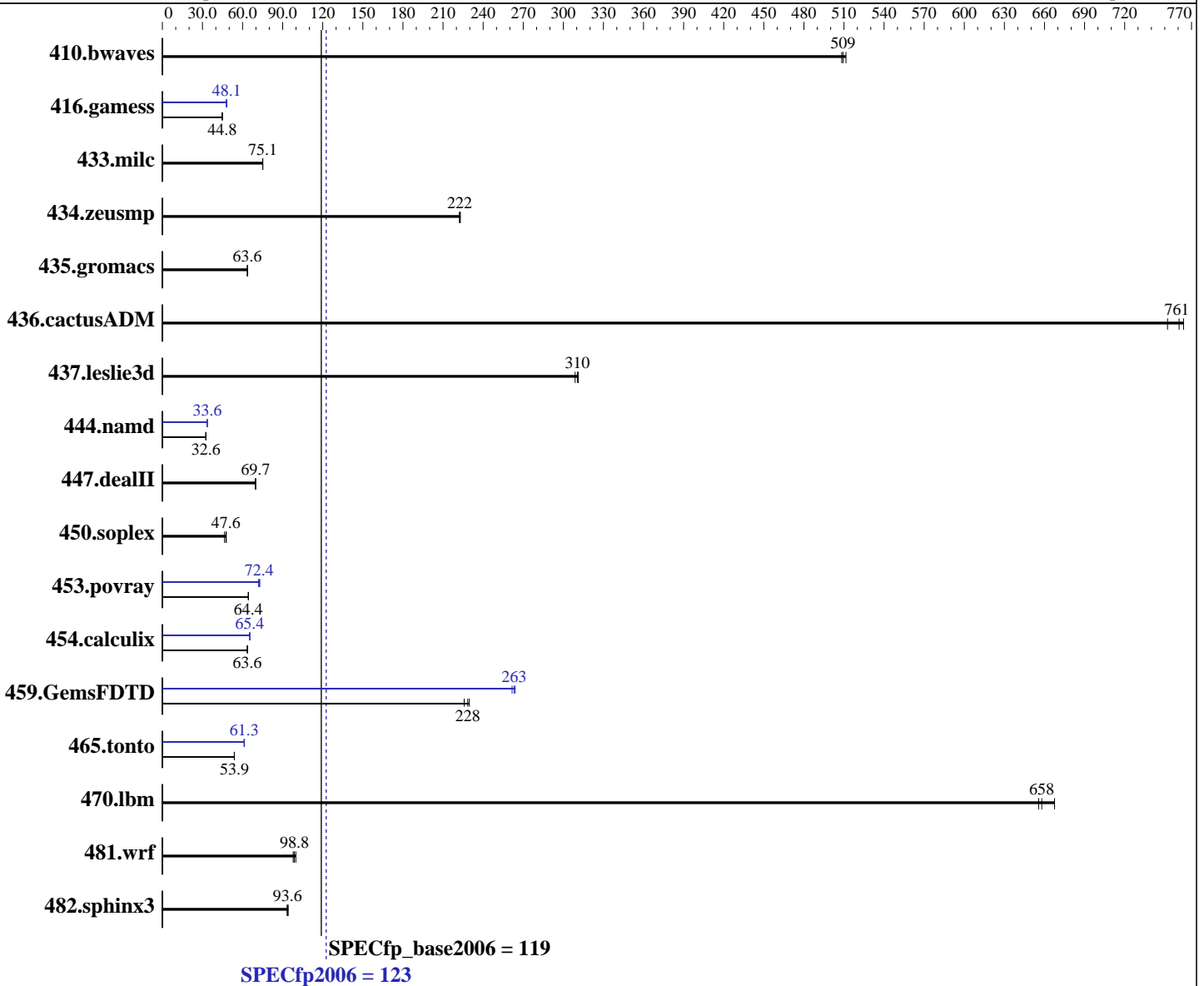
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Mar-2016

Hardware Availability: Mar-2016

Software Availability: Sep-2015



### Hardware

CPU Name: Intel Xeon E5-2643 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 3400  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 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

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### 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: 20 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    | 26.7        | 508         | 26.6        | 511        | <u>26.7</u> | <u>509</u>  | 26.7        | 508         | 26.6        | 511         | <u>26.7</u> | <u>509</u>  |
| 416.gamess    | 438         | 44.7        | 436         | 44.9       | <u>437</u>  | <u>44.8</u> | <u>407</u>  | <u>48.1</u> | 409         | 47.8        | 407         | 48.1        |
| 433.milc      | <u>122</u>  | <u>75.1</u> | 122         | 75.2       | 122         | 75.1        | <u>122</u>  | <u>75.1</u> | 122         | 75.2        | 122         | 75.1        |
| 434.zeusmp    | 40.8        | 223         | <u>40.9</u> | <u>222</u> | 40.9        | 222         | 40.8        | 223         | <u>40.9</u> | <u>222</u>  | 40.9        | 222         |
| 435.gromacs   | 112         | 63.6        | 112         | 63.8       | <u>112</u>  | <u>63.6</u> | 112         | 63.6        | 112         | 63.8        | <u>112</u>  | <u>63.6</u> |
| 436.cactusADM | 15.9        | 752         | <u>15.7</u> | <u>761</u> | 15.6        | 764         | 15.9        | 752         | <u>15.7</u> | <u>761</u>  | 15.6        | 764         |
| 437.leslie3d  | 30.2        | 311         | <u>30.3</u> | <u>310</u> | 30.4        | 309         | 30.2        | 311         | <u>30.3</u> | <u>310</u>  | 30.4        | 309         |
| 444.namd      | 246         | 32.6        | 246         | 32.6       | <u>246</u>  | <u>32.6</u> | 239         | 33.6        | <u>239</u>  | <u>33.6</u> | 239         | 33.6        |
| 447.dealII    | 164         | 69.8        | 164         | 69.7       | <u>164</u>  | <u>69.7</u> | 164         | 69.8        | 164         | 69.7        | <u>164</u>  | <u>69.7</u> |
| 450.soplex    | 174         | 47.8        | 179         | 46.5       | <u>175</u>  | <u>47.6</u> | 174         | 47.8        | 179         | 46.5        | <u>175</u>  | <u>47.6</u> |
| 453.povray    | <u>82.6</u> | <u>64.4</u> | 82.8        | 64.2       | 82.5        | 64.5        | <u>73.5</u> | <u>72.4</u> | 72.9        | 72.9        | 73.9        | 72.0        |
| 454.calculix  | 130         | 63.5        | 130         | 63.6       | <u>130</u>  | <u>63.6</u> | 126         | 65.3        | 126         | 65.4        | <u>126</u>  | <u>65.4</u> |
| 459.GemsFDTD  | <u>46.4</u> | <u>228</u>  | 47.0        | 226        | 46.2        | 230         | <u>40.3</u> | <u>263</u>  | 40.6        | 262         | 40.2        | 264         |
| 465.tonto     | 183         | 53.9        | 183         | 53.8       | <u>183</u>  | <u>53.9</u> | 161         | 61.2        | 161         | 61.3        | <u>161</u>  | <u>61.3</u> |
| 470.lbm       | 20.6        | 668         | 21.0        | 656        | <u>20.9</u> | <u>658</u>  | 20.6        | 668         | 21.0        | 656         | <u>20.9</u> | <u>658</u>  |
| 481.wrf       | <u>113</u>  | <u>98.8</u> | 112         | 99.9       | 114         | 97.9        | <u>113</u>  | <u>98.8</u> | 112         | 99.9        | 114         | 97.9        |
| 482.sphinx3   | 209         | 93.3        | 207         | 94.2       | <u>208</u>  | <u>93.6</u> | 209         | 93.3        | 207         | 94.2        | <u>208</u>  | <u>93.6</u> |

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:  
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 Mon Mar 28 19:15:28 2016

This section contains SUT (System Under Test) info as seen by  
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CPU2006 license: 001176  
Test sponsor: Supermicro  
Tested by: Supermicro

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

### Platform Notes (Continued)

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 E5-2643 v4 @ 3.40GHz
 2 "physical id"s (chips)
 12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 6 7
physical 1: cores 0 1 2 3 6 7
cache size : 20480 KB
```

```
From /proc/meminfo
MemTotal:      264569680 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 28 14:32
```

```
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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## 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 = "12"

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

437.leslie3d: -DSPEC\_CPU\_LP64

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## Base Portability Flags (Continued)

```

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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Software Availability: Sep-2015

## 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

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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>

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 other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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