



# SPEC® CFP2006 Result

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## Supermicro

SuperServer 2048U-RTR4  
(X10QRH+ , Intel Xeon E5-4660 v3)

**SPECfp®2006 = 104**

**SPECfp\_base2006 = 97.8**

CPU2006 license: 001176

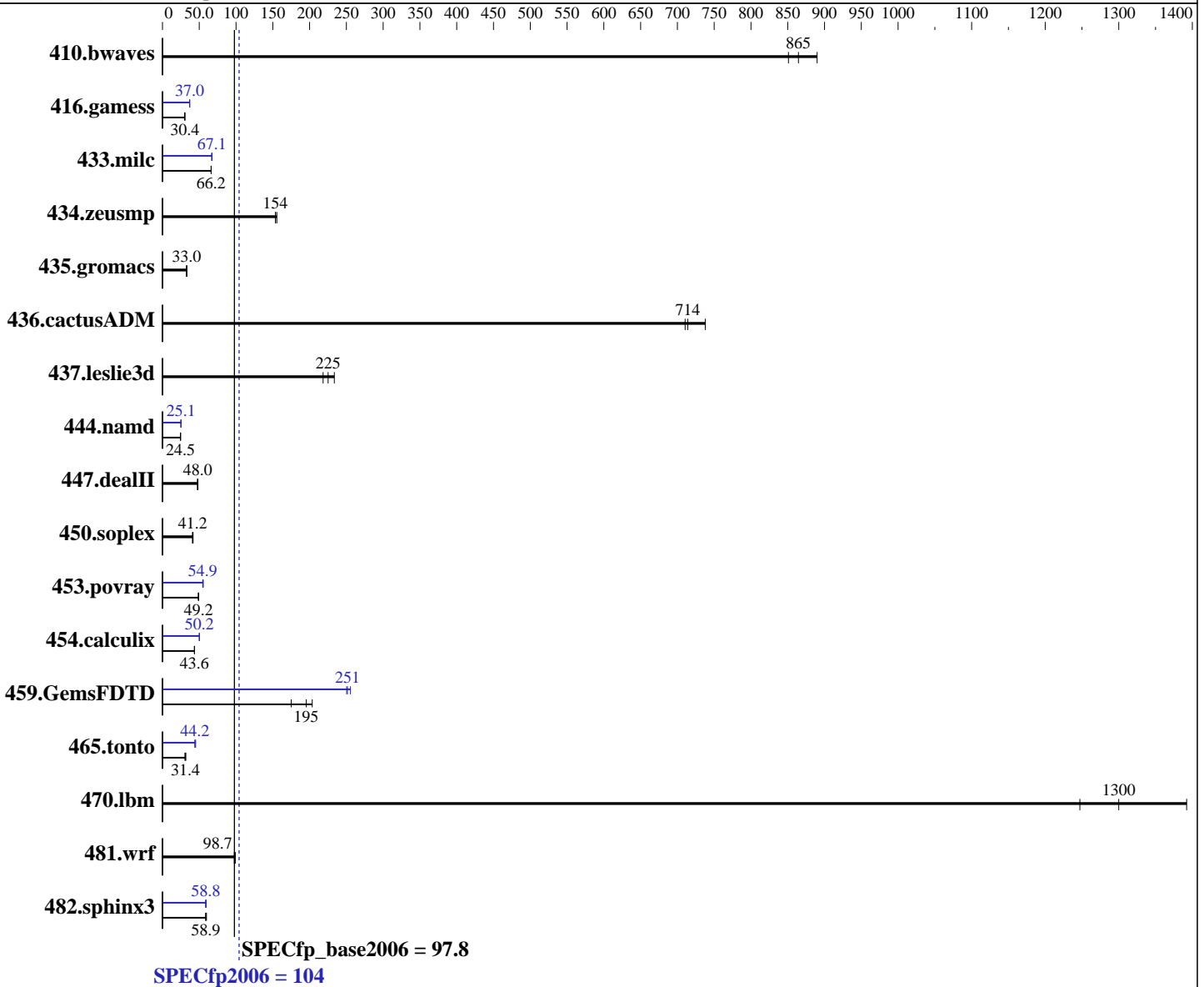
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Jun-2015

Hardware Availability: Jun-2015

Software Availability: Oct-2014



### Hardware

CPU Name: Intel Xeon E5-4660 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz  
 CPU MHz: 2100  
 FPU: Integrated  
 CPU(s) enabled: 56 cores, 4 chips, 14 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

Continued on next page

### 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: 35 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    | <b>15.7</b> | <b>865</b>  | 15.3        | 890         | 16.0        | 851         | <b>15.7</b> | <b>865</b>  | 15.3       | 890         | 16.0        | 851         |
| 416.gamess    | 648         | 30.2        | <b>644</b>  | <b>30.4</b> | 643         | 30.4        | 531         | 36.9        | <b>530</b> | <b>37.0</b> | 528         | 37.1        |
| 433.milc      | <b>139</b>  | <b>66.2</b> | 139         | 66.2        | 139         | 66.1        | 137         | 66.9        | 136        | 67.4        | <b>137</b>  | <b>67.1</b> |
| 434.zeusmp    | <b>59.2</b> | <b>154</b>  | 59.2        | 154         | 58.5        | 155         | <b>59.2</b> | <b>154</b>  | 59.2       | 154         | 58.5        | 155         |
| 435.gromacs   | 216         | 33.0        | 219         | 32.6        | <b>216</b>  | <b>33.0</b> | 216         | 33.0        | 219        | 32.6        | <b>216</b>  | <b>33.0</b> |
| 436.cactusADM | <b>16.7</b> | <b>714</b>  | 16.8        | 711         | 16.2        | 738         | <b>16.7</b> | <b>714</b>  | 16.8       | 711         | 16.2        | 738         |
| 437.leslie3d  | 43.0        | 218         | 40.2        | 234         | <b>41.7</b> | <b>225</b>  | 43.0        | 218         | 40.2       | 234         | <b>41.7</b> | <b>225</b>  |
| 444.namd      | 327         | 24.5        | <b>327</b>  | <b>24.5</b> | 327         | 24.5        | <b>319</b>  | <b>25.1</b> | 318        | 25.2        | 319         | 25.1        |
| 447.dealII    | 241         | 47.5        | 237         | 48.2        | <b>239</b>  | <b>48.0</b> | 241         | 47.5        | 237        | 48.2        | <b>239</b>  | <b>48.0</b> |
| 450.soplex    | 204         | 40.8        | <b>202</b>  | <b>41.2</b> | 201         | 41.6        | 204         | 40.8        | <b>202</b> | <b>41.2</b> | 201         | 41.6        |
| 453.povray    | 108         | 49.3        | 110         | 48.6        | <b>108</b>  | <b>49.2</b> | 97.1        | 54.8        | 95.9       | 55.5        | <b>97.0</b> | <b>54.9</b> |
| 454.calculix  | <b>189</b>  | <b>43.6</b> | 189         | 43.6        | 191         | 43.3        | <b>164</b>  | <b>50.2</b> | 165        | 50.1        | 164         | 50.2        |
| 459.GemsFDTD  | 60.6        | 175         | <b>54.3</b> | <b>195</b>  | 52.1        | 204         | 42.4        | 250         | 41.5       | 256         | <b>42.2</b> | <b>251</b>  |
| 465.tonto     | <b>314</b>  | <b>31.4</b> | 311         | 31.7        | 323         | 30.5        | 223         | 44.2        | <b>223</b> | <b>44.2</b> | 218         | 45.1        |
| 470.lbm       | <b>10.6</b> | <b>1300</b> | 11.0        | 1250        | 9.87        | 1390        | <b>10.6</b> | <b>1300</b> | 11.0       | 1250        | 9.87        | 1390        |
| 481.wrf       | 114         | 97.7        | 113         | 99.0        | <b>113</b>  | <b>98.7</b> | 114         | 97.7        | 113        | 99.0        | <b>113</b>  | <b>98.7</b> |
| 482.sphinx3   | 326         | 59.8        | <b>331</b>  | <b>58.9</b> | 332         | 58.7        | <b>331</b>  | <b>58.8</b> | 328        | 59.5        | 332         | 58.8        |

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 linux-rrui Sun Jun 14 12:48:45 2015

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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**Tested by:** Supermicro

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

### 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 E5-4660 v3 @ 2.10GHz
 4 "physical id"s (chips)
 56 "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 : 14
siblings : 14
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 35840 KB
```

```
From /proc/meminfo
MemTotal: 529335176 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 linux-rrui 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 14 06:36
```

```
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
Continued on next page
```



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### Platform Notes (Continued)

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  
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 = "56"

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



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## 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.dealIII: 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



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

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