



# SPEC® CFP2006 Result

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## Supermicro

SuperServer 6018R-TDTP  
(X10DRD-LTP , Intel Xeon E5-2660 v4)

**SPECfp®2006 = 115**

**SPECfp\_base2006 = 108**

CPU2006 license: 001176

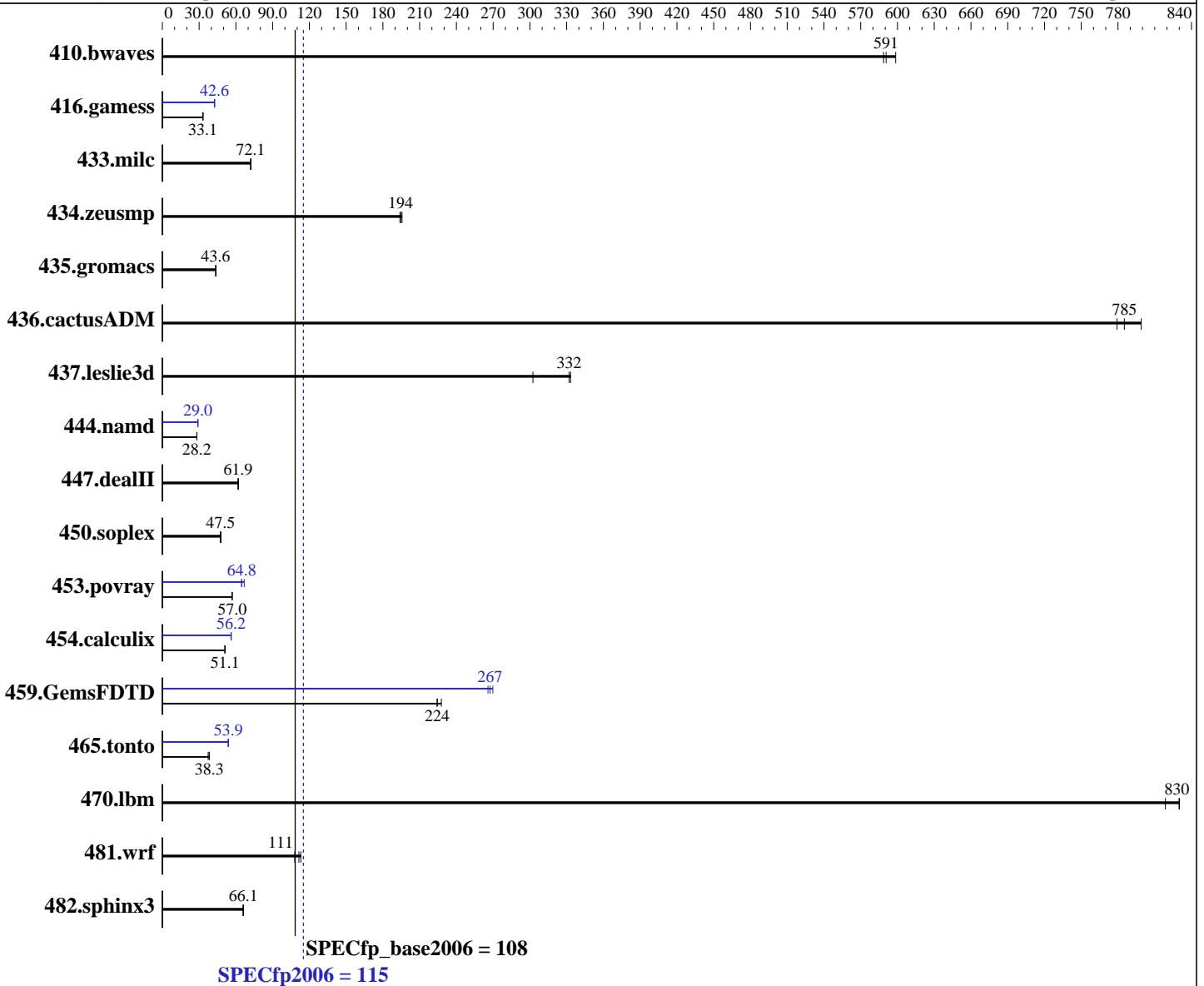
Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2016

Hardware Availability: Mar-2016

Software Availability: Sep-2015



**Hardware**

CPU Name: Intel Xeon E5-2660 v4  
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
CPU MHz: 2000  
FPU: Integrated  
CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip, 2 threads/core  
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: Red Hat Enterprise Linux Server release 7.2, Kernel 3.10.0-327.el7.x86\_64  
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: xfs  
System State: Run level 3 (multi-user)

Continued on next page



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L3 Cache: 35 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)  
Disk Subsystem: 1 x 400 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	22.7	599	<b><u>23.0</u></b>	<b><u>591</u></b>	23.1	589	22.7	599	<b><u>23.0</u></b>	<b><u>591</u></b>	23.1	589
416.gamess	<b><u>591</u></b>	<b><u>33.1</u></b>	590	33.2	591	33.1	<b><u>460</u></b>	<b><u>42.6</u></b>	459	42.6	460	42.6
433.milc	127	72.3	<b><u>127</u></b>	<b><u>72.1</u></b>	127	72.0	127	72.3	<b><u>127</u></b>	<b><u>72.1</u></b>	127	72.0
434.zeusmp	46.9	194	<b><u>46.8</u></b>	<b><u>194</u></b>	46.5	196	46.9	194	<b><u>46.8</u></b>	<b><u>194</u></b>	46.5	196
435.gromacs	164	43.6	164	43.6	<b><u>164</u></b>	<b><u>43.6</u></b>	164	43.6	164	43.6	<b><u>164</u></b>	<b><u>43.6</u></b>
436.cactusADM	15.3	779	15.0	799	<b><u>15.2</u></b>	<b><u>785</u></b>	15.3	779	15.0	799	<b><u>15.2</u></b>	<b><u>785</u></b>
437.leslie3d	31.1	302	<b><u>28.3</u></b>	<b><u>332</u></b>	28.2	333	31.1	302	<b><u>28.3</u></b>	<b><u>332</u></b>	28.2	333
444.namd	<b><u>285</u></b>	<b><u>28.2</u></b>	285	28.2	285	28.2	276	29.0	<b><u>277</u></b>	<b><u>29.0</u></b>	277	29.0
447.dealII	185	61.8	184	62.0	<b><u>185</u></b>	<b><u>61.9</u></b>	185	61.8	184	62.0	<b><u>185</u></b>	<b><u>61.9</u></b>
450.soplex	174	47.9	177	47.2	<b><u>176</u></b>	<b><u>47.5</u></b>	174	47.9	177	47.2	<b><u>176</u></b>	<b><u>47.5</u></b>
453.povray	93.8	56.7	<b><u>93.3</u></b>	<b><u>57.0</u></b>	93.2	57.1	79.6	66.8	<b><u>82.1</u></b>	<b><u>64.8</u></b>	82.3	64.6
454.calculix	161	51.1	162	51.0	<b><u>161</u></b>	<b><u>51.1</u></b>	147	56.1	147	56.2	<b><u>147</u></b>	<b><u>56.2</u></b>
459.GemsFDTD	<b><u>47.3</u></b>	<b><u>224</u></b>	46.6	228	47.3	224	39.3	270	39.9	266	<b><u>39.7</u></b>	<b><u>267</u></b>
465.tonto	<b><u>257</u></b>	<b><u>38.3</u></b>	263	37.4	257	38.3	<b><u>183</u></b>	<b><u>53.9</u></b>	183	53.7	183	53.9
470.lbm	<b><u>16.6</u></b>	<b><u>830</u></b>	16.6	830	16.8	819	<b><u>16.6</u></b>	<b><u>830</u></b>	16.6	830	16.8	819
481.wrf	103	108	98.8	113	<b><u>100</u></b>	<b><u>111</u></b>	103	108	98.8	113	<b><u>100</u></b>	<b><u>111</u></b>
482.sphinx3	<b><u>295</u></b>	<b><u>66.1</u></b>	294	66.2	296	65.8	<b><u>295</u></b>	<b><u>66.1</u></b>	294	66.2	296	65.8

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:

Early Snoop = Disable

Sysinfo program /home/cpu2006\_ic16/config/sysinfo.rev6914

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1

running on localhost.localdomain Tue May 24 19:51:31 2016

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>

Continued on next page



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

### Platform Notes (Continued)

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2660 v4@ 2.00GHz
 2 "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  : 28
 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
cache size : 35840 KB

```

```

From /proc/meminfo
MemTotal:      263858092 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.2 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.2"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

```

```

uname -a:
Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 May 24 19:50

```

SPEC is set to: /home/cpu2006_ic16
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   216G  4.4G  212G   3% /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. 2.0 02/26/2016
Memory:
 8x Micron 36ASF4G72PZ-2G3A1 32 GB 2 rank 2400 MHz

```

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## Platform Notes (Continued)

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:

```
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/home/cpu2006_ic16/libs/32:/home/cpu2006_ic16/libs/64:/home/cpu2006_ic16/sh"
OMP_NUM_THREADS = "28"
```

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
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
```

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## Base Portability Flags (Continued)

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: basepeak = yes

Continued on next page



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## Peak Optimization Flags (Continued)

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  
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

Continued on next page



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## Peak Optimization Flags (Continued)

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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