# SPEC® CFP2006 Result

## Supermicro
Supermicro C7Z170-M motherboard (C7Z170-M, Intel Core i5-6400T)

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>76.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>74.3</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 001176

**Test date:** Oct-2015

**Test sponsor:** Supermicro

**Tested by:** Supermicro

**Hardware Availability:** Sep-2015

**Software Availability:** Sep-2014

### Software

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Red Hat Enterprise Linux Server release 7.1, Kernel 3.10.0-229.el7.x86_64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler</td>
<td>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</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>CPU Name</th>
<th>Intel Core i5-6400T</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 2.80 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2200</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>4 cores, 1 chip, 4 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1 chip</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

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**410.bwaves**

**416.gamess**

**433.milc**

**434.zeusmp**

**435.gromacs**

**436.cactusADM**

**437.leslie3d**

**444.namd**

**447.dealII**

**450.soplex**

**453.povray**

**454.calculix**

**459.GemsFDTD**

**465.tonto**

**470.lbm**

**481.wrf**

**482.sphinx3**

**SPECfp_base2006 = 74.3**

**SPECfp®2006 = 76.7**

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| SPECfp_base2006 = | 74.3 |

**CPU2006 license:** 001176  
**Test sponsor:** Supermicro  
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| L3 Cache: | 6 MB I+D on chip per chip | Base Pointers: | 64-bit |
| Other Cache: | None | Peak Pointers: | 32/64-bit |
| Memory: | 16 GB (4 x 4 GB 1Rx8 PC4-2666P-U, running at 2133 MHz) | Other Software: | None |
| Disk Subsystem: | 1 x 200 GB SATA III SSD | Base Pointers: | 64-bit |
| Other Hardware: | None | Peak Pointers: | 32/64-bit |

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

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>410.bwaves</td>
<td>97.0</td>
<td>140</td>
</tr>
<tr>
<td>416.gamess</td>
<td>561</td>
<td>34.9</td>
</tr>
<tr>
<td>433.milc</td>
<td>103</td>
<td>88.8</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>52.6</td>
<td>173</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>169</td>
<td>42.1</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>43.6</td>
<td>274</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>94.4</td>
<td>99.6</td>
</tr>
<tr>
<td>444.namd</td>
<td>299</td>
<td>26.9</td>
</tr>
<tr>
<td>447.dealII</td>
<td>210</td>
<td>54.4</td>
</tr>
<tr>
<td>450.soplex</td>
<td>198</td>
<td>42.0</td>
</tr>
<tr>
<td>453.povray</td>
<td>103</td>
<td>51.7</td>
</tr>
<tr>
<td>454.calculix</td>
<td>152</td>
<td>54.2</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>136</td>
<td>77.9</td>
</tr>
<tr>
<td>465.tonto</td>
<td>220</td>
<td>44.7</td>
</tr>
<tr>
<td>470.lbm</td>
<td>76.1</td>
<td>180</td>
</tr>
<tr>
<td>481.wrf</td>
<td>109</td>
<td>102</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>287</td>
<td>67.9</td>
</tr>
</tbody>
</table>

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

As tested, the system used a Supermicro CSE-731i-300B chassis. The chassis is configured with a PWS-305-PQ power supply, 1 SNR-P0046A4 heatsink, as well as 1 FAN-0108L4 rear cooling fan.

Sysinfo program /usr/cpu2006/config/sysinfo.rev6914  
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1  

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

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Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
### Platform Notes (Continued)

From `/proc/cpuinfo`
- `model name`: Intel(R) Core(TM) i5-6400T CPU @ 2.20GHz
- `1 "physical id"s (chips)
- `4 "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`: 4
- `siblings`: 4
- `physical 0: cores 0 1 2 3`
- `cache size`: 6144 KB

From `/proc/meminfo`
- `MemTotal`: 16334556 kB
- `HugePages_Total`: 0
- `Hugepagesize`: 2048 kB

From `/etc/*release* /etc/*version*`
- `NAME`: Red Hat Enterprise Linux Server
- `VERSION`: 7.1 (Maipo)
- `ID`: rhel
- `ID_LIKE`: fedora
- `VERSION_ID`: 7.1
- `PRETTY_NAME`: Red Hat Enterprise Linux Server 7.1 (Maipo)
- `ANSI_COLOR`: 0;31
- `redhat-release`: Red Hat Enterprise Linux Server release 7.1 (Maipo)
- `system-release`: Red Hat Enterprise Linux Server release 7.1 (Maipo)

`uname -a`:
```
Linux C7Z170-01 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38 EST 2015
x86_64 x86_64 x86_64 GNU/Linux
```
- `run-level`: 3 Oct 30 01:22

`SPEC` is set to: `/usr/cpu2006`
- `Filesystem` | `Type` | `Size` | `Used` | `Avail` | `Use%` | `Mounted on`
- `/dev/sda2` | xfs | 183G | 36G | 147G | 20% | /

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. T20151015150001 10/15/2015
- Memory:
  - 4x 0420 F4-2666C15-4GRR 4 GB 1 rank 2133 MHz
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(C7Z170-M, Intel Core i5-6400T)

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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 = "/usr/cpu2006/libs/32:/usr/cpu2006/libs/64:/usr/cpu2006/sh"
OMP_NUM_THREADS = "4"

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

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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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-auto-ilkp32 -ansi-alias

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Peak Optimization Flags (Continued)

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
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

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Peak Optimization Flags (Continued)

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.

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