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

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

SPECfp®2006 = 86.2
SPECfp_base2006 = 84.0

Hardware
CPU Name: Intel Core i5-6400
CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz: 2700
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
CPU(s) orderable: 1 chip
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Software
Operating System: Red Hat Enterprise Linux Server release 7.1, Kernel 3.10.0-229.el7.x86_64
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: xfs
System State: Run level 3 (multi-user)
Supermicro

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

SPECfp2006 = 86.2
SPECfp_base2006 = 84.0

CPU2006 license: 001176
Test sponsor: Supermicro
Hardware Availability: Sep-2015
Tested by: Supermicro
Software Availability: Sep-2014

LC3 Cache: 6 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (4 x 4 GB 1Rx8 PC4-2666P-U, running at 2133 MHz)
Disk Subsystem: 1 x 200 GB SATA III SSD
Other Hardware: None
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

<table>
<thead>
<tr>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>83.3</td>
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</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
running on C7Z170-01 Thu Oct 29 20:08:27 2015

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

SPECfp2006 = 86.2
SPECfp_base2006 = 84.0

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

Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Core(TM) i5-6400 CPU @ 2.70GHz
  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*
os-release:
  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"
  CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
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 29 01:05

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

Continued on next page
Supermicro C7Z170-M motherboard (C7Z170-M, Intel Core i5-6400)

SPECfp2006 = 86.2
SPECfp_base2006 = 84.0

CPU2006 license: 001176
Test sponsor: Supermicro
Tested by: Supermicro
Test date: Oct-2015
Hardware Availability: Sep-2015
Software Availability: Sep-2014

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

Continued on next page
Supermicro
Supermicro C7Z170-M motherboard
(C7Z170-M, Intel Core i5-6400)

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>86.2</th>
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</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>84.0</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 001176  
**Test date:** Oct-2015  
**Test sponsor:** Supermicro  
**Hardware Availability:** Sep-2015  
**Tested by:** Supermicro  
**Software Availability:** Sep-2014

---

**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)
  -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
  -auto-ilp32 -ansi-alias
  ```

  Continued on next page
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)
-03(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)
-03(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)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

343.zeusmp: basepeak = yes

347.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(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)
-03(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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## Supermicro C7Z170-M motherboard
(C7Z170-M, Intel Core i5-6400)

| SPECfp2006 | 86.2 |
| SPECfp_base2006 | 84.0 |

| CPU2006 license: | 001176 |
| Test sponsor: | Supermicro |
| Tested by: | Supermicro |
| Test date: | Oct-2015 |
| Hardware Availability: | Sep-2015 |
| Software Availability: | Sep-2014 |

### Peak Optimization Flags (Continued)

```plaintext
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/Intel-ic15.0-official-linux64.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/Intel-ic15.0-official-linux64.xml)
- [http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revG.20141230.00.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.

Tested with SPEC CPU2006 v1.2.
Originally published on 17 November 2015.