Supermicro
SuperWorkstation 5039C-I (X11SCL-F, Intel Xeon E-2174G)

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**CPU2017 License:** 001176
**Test Date:** Oct-2018
**Test Sponsor:** Supermicro
**Hardware Availability:** Nov-2018
**Tested by:** Supermicro
**Software Availability:** Mar-2018

<table>
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<tr>
<td>4</td>
<td>603.bwaves_s</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>607.cactuBSSN_s</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>619.lbm_s</td>
<td>31.6</td>
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<tr>
<td>4</td>
<td>621.wrf_s</td>
<td>29.7</td>
</tr>
<tr>
<td>4</td>
<td>627.cam4_s</td>
<td>20.4</td>
</tr>
<tr>
<td>4</td>
<td>628.pop2_s</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>638.imagick_s</td>
<td>18.0</td>
</tr>
<tr>
<td>4</td>
<td>644.nab_s</td>
<td>15.5</td>
</tr>
<tr>
<td>4</td>
<td>649.fotonik3d_s</td>
<td>8.00</td>
</tr>
<tr>
<td>4</td>
<td>654.roms_s</td>
<td>15.6</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon E-2174G
- **Max MHz.:** 4700
- **Nominal:** 3800
- **Enabled:** 4 cores, 1 chip
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 256 KB I+D on chip per core
- **Cache L3:** 8 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
- **Storage:** 1 x 4 TB SATA III 7200 RPM
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64)
- **Kernel:** 4.4.114-94.11-default
- **Compiler:**
  - C/C++: Version 18.0.2.199 of Intel C/C++
  - Fortran: Version 18.0.2.199 of Intel Fortran
- **Compiler for Linux:**
- **Parallel:** Yes
- **Firmware:** Supermicro BIOS version 1.0 released Sep-2018
- **File System:** xfs
- **System State:** Run level 5 (multi-user with display manager)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** jemalloc memory allocator library V5.0.1
## SPEC CPU2017 Floating Point Speed Result

**Supermicro**

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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>607.cactuBSSN_s</td>
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<tr>
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<td>29.6</td>
<td>399</td>
<td>29.8</td>
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<tr>
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<td>708</td>
<td>20.4</td>
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<td>20.4</td>
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<tr>
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<td>18.0</td>
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<td>654.roms_s</td>
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<td>1014</td>
<td>15.5</td>
<td>1014</td>
<td>15.5</td>
</tr>
</tbody>
</table>

### Specspeed2017_fp_base = 24.9

### Specspeed2017_fp_peak = 25.2

---

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

### General Notes

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

```
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"
```

Binaries compiled on a system with 1x Intel Core i7-6700K CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Files system page cache synced and cleared with:

```
sync; echo 3>/proc/sys/vm/drop_caches
```

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Supermicro
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SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECspeed2017_fp_base = 24.9
SPECspeed2017_fp_peak = 25.2

Platform Notes

BIOS Settings:
Hyper-Threading = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd08f2999c33d61f64985e45859ea9
running on linux-qswb Fri Oct 19 03:14:38 2018

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name: Intel(R) Xeon(R) E-2174G CPU @ 3.80GHz
  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

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2174G CPU @ 3.80GHz
Stepping: 10
CPU MHz: 4697.782
CPU max MHz: 4700.0000
CPU min MHz: 800.0000
BogoMIPS: 7583.97
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-3
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp

(Continued on next page)
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Platform Notes (Continued)

lm constant_tsc art arch_perfmon pebs bts rep_good nop1 xtopology nonstop_tsc
aperfmpref eagerfpus pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcmt peic sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lhf_lmm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm hwp hwp_notif hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl retpoline
kaiser tpr_shadow vmi flexpriority ept vpid fsqsgbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1

/proc/cpuinfo cache data
cache size : 8192 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
   available: 1 nodes (0)
   node 0 cpus: 0 1 2 3
   node 0 size: 64151 MB
   node 0 free: 54089 MB
   node distances:
     node 0
       0:  10

From /proc/meminfo
MemTotal:    65690624 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP3

From /etc/*release*/etc/*version *
SuSE-release:
   SUSE Linux Enterprise Server 12 (x86_64)
   VERSION = 12
   PATCHLEVEL = 3
   # 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-SP3"
      VERSION_ID="12.3"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
Linux linux-qswb 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)

(Continued on next page)
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**Supermicro**

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---

### Platform Notes (Continued)

- **x86_64 x86_64 x86_64 GNU/Linux**

  Kernel self-reported vulnerability status:

  - CVE-2017-5754 (Meltdown): Mitigation: PTI
  - CVE-2017-5753 (Spectre variant 1): Mitigation: Barriers
  - CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

  **run-level 5 Oct 18 22:07**

  **SPEC is set to:** /home/cpu2017

  **Filesystem**  
  **Type**  
  **Size**  
  **Used**  
  **Avail**  
  **Use%**  
  **Mounted on**

  - /dev/sda4  
    - **xfs**  
    - 3.6T  
    - 9.9G  
    - 3.6T  
    - 1%  
    - /home

  **Additional information from dmidecode follows. 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. 1.0 09/17/2018**

  **Memory:**
  - 4x Micron 18ADF2G72AZ-2G6H1R 16 GB 2 rank 2667

  (End of data from sysinfo program)

---

### Compiler Version Notes

---

```
CC  619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
```

---

```
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

---

```
CC  619.lbm_s(peak)
```

---

```
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

---

```
FC  607.cactuBSSN_s(base, peak)
```

---

```
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
```

(Continued on next page)
Spec CPU2017 Floating Point Speed Result

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Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

Fortran benchmarks:
```
ifort -m64
```

(Continued on next page)
**SPEC CPU2017 Floating Point Speed Result**

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### Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```bash
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```bash
icpc -m64 icc -m64 -std=c11 ifort -m64
```

### Base Portability Flags

- 603.bwaves_s: -DSPEC_LP64
- 607.cactuBSSN_s: -DSPEC_LP64
- 619.lbm_s: -DSPEC_LP64
- 621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
- 627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
- 628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
  -assume byterecl
- 638.imagick_s: -DSPEC_LP64
- 644.nab_s: -DSPEC_LP64
- 649.fotonik3d_s: -DSPEC_LP64
- 654.roms_s: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**

```bash
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

**Fortran benchmarks:**

```bash
-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

**Benchmarks using both Fortran and C:**

```bash
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

**Benchmarks using Fortran, C, and C++:**

```bash
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```
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Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs
649.fotonik3d_s: Same as 603.bwaves_s
654.roms_s: -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

(Continued on next page)
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Peak Optimization Flags (Continued)

### 621.wrf_s
- `-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2`
- `qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div`
- `qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp`
- `DSPEC_OPENMP -nostandard-realloc-lhs`

### 627.cam4_s
- `xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
- `ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp`
- `DSPEC_OPENMP -nostandard-realloc-lhs`

### 628.pop2_s
- Same as 621.wrf_s

### 607.cactuBSSN_s
- `basepeak = yes`

The flags files that were used to format this result can be browsed at


You can also download the XML flags sources by saving the following links:


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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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