Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

| SPECspeed2017_fp_base | 32.2 |
| SPECspeed2017_fp_peak | 32.6 |

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<tr>
<td>628.pop2_s</td>
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<tr>
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</tr>
<tr>
<td>654.roms_s</td>
<td>8</td>
<td>16.2</td>
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</table>

**Hardware**

- **CPU Name:** Intel Core i7-9700K
- **Max MHz.:** 4900
- **Nominal:** 3600
- **Enabled:** 8 cores, 1 chip
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 256 KB I+D on chip per core
- **L3:** 12 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
- **Storage:** 1 x 200 GB SATA III SSD
- **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++
- **Compiler for Linux:** Fortran: Version 18.0.2.199 of Intel Fortran
- **Parallel:** Yes
- **Compiler for Linux:**
- **Firmware:** Version 1.0a released Sep-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** jemalloc memory allocator library V5.0.1
Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

SPECspeed2017_fp_base = 32.2
SPECspeed2017_fp_peak = 32.6

Results Table

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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>969</td>
<td>16.2</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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/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
Filesystem 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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
# SPEC CPU2017 Floating Point Speed Result

## Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

| SPECspeed2017_fp_base | 32.2 |
| SPECspeed2017_fp_peak | 32.6 |

| CPU2017 License: | 001176 |
| Test Sponsor: | Supermicro |
| Test Date: | Jan-2019 |
| Hardware Availability: | Oct-2018 |
| Tested by: | Supermicro |
| Software Availability: | Mar-2018 |

## Platform Notes
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd8f2999c33d61f64985e45859ea9
running on linux-65nv Sat Jan  5 10:40:41 2019

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) Core(TM) i7-9700K CPU @ 3.60GHz
1 "physical id"s (chips)
8 "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 : 8
siblings : 8
physical 0: cores 0 1 2 3 4 5 6 7
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Core(TM) i7-9700K CPU @ 3.60GHz
Stepping: 12
CPU MHz: 4801.017
CPU max MHz: 4900.0000
CPU min MHz: 800.0000
BogoMIPS: 7199.97
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-7
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 lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
```

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

**Supermicro**
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

**SPECspeed2017_fp_base = 32.2**

**SPECspeed2017_fp_peak = 32.6**

---

**CPU2017 License:** 001176
**Test Date:** Jan-2019
**Test Sponsor:** Supermicro
**Hardware Availability:** Oct-2018
**Tested by:** Supermicro
**Software Availability:** Mar-2018

---

**Platform Notes (Continued)**

fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm hwp hwp_notify hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl retpoline
kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaves opt xsavex xgetbv1

/proc/cpuinfo cache data
  cache size: 12288 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 4 5 6 7
  node 0 size: 64283 MB
  node 0 free: 41342 MB
  node distances:
    node 0
      0: 10

From /proc/meminfo
  MemTotal: 65825824 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

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-65nv 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI

(Continued on next page)
Platform Notes (Continued)

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

run-level 3 Jan 4 14:01

SPEC is set to: /home/cpu2017
   Filesystem  Type Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   145G   36G  110G  25% /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. 1.0a 09/27/2018
   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.
------------------------------------------------------------------------------

==============================================================================
 FC  607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
            icpc (ICC) 18.0.2 20180210
            Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

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

**Supermicro**
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

<table>
<thead>
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<th>SPECspeed2017_fp_peak</th>
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<td>32.6</td>
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**CPU2017 License:** 001176
**Test Sponsor:** Supermicro
**Tested by:** Supermicro

**Test Date:** Jan-2019
**Hardware Availability:** Oct-2018
**Software Availability:** Mar-2018

#### Compiler Version Notes (Continued)

```
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)
```

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

```
FC  603.bwaves_s(peak) 649.fotonik3d_s(peak)
```

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

```
CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
```

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

```
CC  621.wrf_s(peak) 628.pop2_s(peak)
```

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

### Base Compiler Invocation

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

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

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
```
## SPEC CPU2017 Floating Point Speed Result

**Supermicro**  
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)  

| SPECspeed2017_fp_base | 32.2 |
| SPECspeed2017_fp_peak | 32.6 |

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tr>
<td>603.bwaves_s</td>
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<td>607.cactuBSSN_s</td>
<td>-DSPEC_LP64</td>
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<td>619.lbm_s</td>
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<td>621.wrf_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
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<td>627.cam4_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG</td>
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<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
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<td>638.imagick_s</td>
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<td>654.roms_s</td>
<td>-DSPEC_LP64</td>
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</tbody>
</table>

### Base Optimization Flags

#### C benchmarks:

- `-Wl,-z,muldefs`  
- `--xcore-avx2`  
- `-ipo -O3 -no-prec-div -qopt-prefetch`  
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`  
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

#### Fortran benchmarks:

- `-Wl,-z,muldefs`  
- `--dspec-openmp`  
- `--xcore-avx2`  
- `-ipo -O3 -no-prec-div -qopt-prefetch`  
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp`  
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

#### Benchmarks using both Fortran and C:

- `-Wl,-z,muldefs`  
- `--xcore-avx2`  
- `-ipo -O3 -no-prec-div -qopt-prefetch`  
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`  
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

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

- `-Wl,-z,muldefs`  
- `--xcore-avx2`  
- `-ipo -O3 -no-prec-div -qopt-prefetch`  
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`  
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

### Peak Compiler Invocation

#### C benchmarks:

- `icc -m64 -std=c11`

#### Fortran benchmarks:

- `ifort -m64`

(Continued on next page)
Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

SPECspeed2017_fp_base = 32.2
SPECspeed2017_fp_peak = 32.6

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Jan-2019
Hardware Availability: Oct-2018
Software Availability: Mar-2018

Peak Compiler Invocation (Continued)

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: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP

644.nab_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: basepeak = yes

649.fotonik3d_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

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:
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

(Continued on next page)
Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Jan-2019
Hardware Availability: Oct-2018
Software Availability: Mar-2018

Peak Optimization Flags (Continued)

627.cam4_s: basepeak = yes
628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:
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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.xml

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Tested with SPEC CPU2017 v1.0.5 on 2019-01-04 21:40:40-0500.
Originally published on 2019-01-22.