## SPEC® CPU2017 Floating Point Speed Result

### Supermicro
SuperServer 5019C-M (X11SCM-F, Intel Xeon E-2174G)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.4</td>
<td>24.7</td>
</tr>
</tbody>
</table>

### Hardware

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

### Software

<table>
<thead>
<tr>
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<th>Value</th>
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<tbody>
<tr>
<td><strong>OS</strong></td>
<td>SUSE Linux Enterprise Server 12 SP3 (x86_64)</td>
</tr>
<tr>
<td><strong>Compiler</strong></td>
<td>C/C++: Version 18.0.2.199 of Intel C/C++</td>
</tr>
<tr>
<td><strong>Parallel</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Firmware</strong></td>
<td>Supermicro BIOS version 1.0 released Sep-2018</td>
</tr>
<tr>
<td><strong>System State</strong></td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Base Pointers</strong></td>
<td>64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers</strong></td>
<td>64-bit</td>
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<tr>
<td><strong>Other</strong></td>
<td>jemalloc memory allocator library V5.0.1</td>
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### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>4</td>
<td>24.4</td>
<td>24.7</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>4</td>
<td>24.4</td>
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</tr>
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Supermicro
SuperServer 5019C-M (X11SCM-F, Intel Xeon E-2174G)

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 24.7

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
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<tr>
<td>644.nab_s</td>
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<td>38.2</td>
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<td>38.2</td>
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<tr>
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<td>17.6</td>
<td>519</td>
<td>17.6</td>
</tr>
<tr>
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<td>15.2</td>
<td>1034</td>
<td>15.2</td>
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<td>1035</td>
<td>15.2</td>
<td>1032</td>
<td>15.3</td>
<td>1037</td>
<td>15.2</td>
</tr>
</tbody>
</table>

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"
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.
SPEC CPU2017 Floating Point Speed Result

Supermicro
SuperServer 5019C-M (X11SCM-F, Intel Xeon E-2174G)  

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>001176</th>
<th>Test Date:</th>
<th>Oct-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Supermicro</td>
<td>Hardware Availability:</td>
<td>Nov-2018</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Supermicro</td>
<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 24.7

BIOS Settings:
Hyper-Threading = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-nj8e Mon Oct 22 22:44:26 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: 4467.404
CPU max MHz: 4700.0000
CPU min MHz: 800.0000
BogoMIPS: 7583.51
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)
SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

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</tbody>
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Oct-2018
Hardware Availability: Nov-2018
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Platform Notes (Continued)

lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref eagerfpu pni pclmulqdq dtc64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtrp pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rcrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm hwp hwp_notify hwp_act_window hwp_elp intel_pt rsb_cxsw spec_ctrl retpoline
kaiser tpr_shadow vmmi flexpriority ept vpid fsqosbase tsc_adjust bmi1 hle avx2 smep
bmi2 ets erms invpcid rtm mpn 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: 56997 MB
    node distances:
        node 0
        0: 10

From /proc/meminfo
    MemTotal: 65690648 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-nj8e 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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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 3 Oct 22 17:53

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 890G 30G 860G 4% /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 09/19/2018
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.
iccc (ICC) 18.0.2 20180210
(Continued on next page)
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#### Compiler Version Notes (Continued)

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<th>FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ifort (IFORT) 18.0.2 20180210</td>
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<tr>
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<th>FC 603.bwaves_s(peak) 649.fotonik3d_s(peak)</th>
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<th>CC 621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)</th>
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<tbody>
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<table>
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<tr>
<th>CC 621.wrf_s(peak) 628.pop2_s(peak)</th>
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<tr>
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#### Base Compiler Invocation

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

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

(Continued on next page)
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- **Software Availability:** Mar-2018

### Base 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
```

### 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:**
```
-W1,-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:**
```
-W1,-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:**
```
-W1,-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++:**
```
-W1,-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
```
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<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.4</td>
<td>24.7</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Test Date:** Oct-2018  
**Tested by:** Supermicro  

**Hardware Availability:** Nov-2018  
**Software Availability:** Mar-2018

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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

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### 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)
Supermicro
SuperServer 5019C-M (X11SCM-F, Intel Xeon E-2174G)

SPEC CPU2017 Floating Point Speed Result
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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

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 2018-10-22 10:44:25-0400.
Originally published on 2018-11-27.