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

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<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong> Intel Core i7-9700K</td>
<td><strong>OS:</strong> SUSE Linux Enterprise Server 12 SP3 (x86_64)</td>
</tr>
<tr>
<td><strong>Max MHz.:</strong> 4900</td>
<td><strong>Kernel:</strong> 4.4.114-94.11-default</td>
</tr>
<tr>
<td><strong>Nominal:</strong> 3600</td>
<td><strong>Compiler:</strong> C/C++: Version 18.0.2.199 of Intel C/C++</td>
</tr>
<tr>
<td><strong>Enabled:</strong> 8 cores, 1 chip</td>
<td><strong>Compiler for Linux:</strong> Fortran: Version 18.0.2.199 of Intel Fortran</td>
</tr>
<tr>
<td><strong>Orderable:</strong> 1 chip</td>
<td><strong>Compiler for Linux:</strong></td>
</tr>
<tr>
<td><strong>Cache L1:</strong> 32 KB I + 32 KB D on chip per core</td>
<td><strong>Parallel:</strong> No</td>
</tr>
<tr>
<td><strong>L2:</strong> 256 KB I+D on chip per core</td>
<td><strong>Firmware:</strong> Version 1.0a released Sep-2018</td>
</tr>
<tr>
<td><strong>L3:</strong> 12 MB I+D on chip per chip</td>
<td><strong>File System:</strong> xfs</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
<td><strong>System State:</strong> Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Memory:</strong> 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)</td>
<td><strong>Base Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td><strong>Storage:</strong> 1 x 200 GB SATA III SSD</td>
<td><strong>Peak Pointers:</strong> 32/64-bit</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
<td><strong>Other:</strong> jemalloc memory allocator library V5.0.1</td>
</tr>
</tbody>
</table>

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

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<td>502.gcc_r</td>
<td>8</td>
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<tr>
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<td>520.omnetpp_r</td>
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<td>523.xalancbmk_r</td>
<td>8</td>
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<tr>
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<tr>
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<td>8</td>
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<tr>
<td>541.leela_r</td>
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<tr>
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SPECrate2017_int_base = 44.8
SPECrate2017_int_peak = 48.0

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>500.perlbench_r</td>
<td>8</td>
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<td>295</td>
<td>43.1</td>
<td>295</td>
<td>43.1</td>
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<td>502.gcc_r</td>
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<td>291</td>
<td>38.9</td>
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<td>38.7</td>
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<td>38.5</td>
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<td>513</td>
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<td>41.4</td>
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<td>41.5</td>
<td>207</td>
<td>40.9</td>
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<tr>
<td>525.x264_r</td>
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<td>109</td>
<td>192</td>
<td>109</td>
<td>192</td>
<td>109</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>8</td>
<td>201</td>
<td>45.7</td>
<td>205</td>
<td>44.6</td>
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<td>44.4</td>
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<td>541.leela_r</td>
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<td>38.6</td>
<td>343</td>
<td>38.6</td>
<td>344</td>
<td>38.6</td>
</tr>
<tr>
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<td>8</td>
<td>194</td>
<td>108</td>
<td>196</td>
<td>107</td>
<td>192</td>
<td>109</td>
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<tr>
<td>557.xz_r</td>
<td>8</td>
<td>327</td>
<td>26.4</td>
<td>350</td>
<td>24.7</td>
<td>350</td>
<td>24.7</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 44.8
SPECrate2017_int_peak = 48.0

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset commands to bind each copy to a specific processor. For details, please see the config file.

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:
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"

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.
jemalloc, a general purpose malloc implementation

(Continued on next page)
Supermicro
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SPEC CPU2017 Integer Rate Result
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro
Test Date: Jan-2019
Hardware Availability: Oct-2018
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General Notes (Continued)
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-65nv Fri Jan 4 14:19:12 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:            4771.037
CPU max MHz:        4900.000
CPU min MHz:        800.000
BogoMIPS:           7199.97
Virtualization:     VT-x
L1d cache:          32K
L1i cache:          32K
L2 cache:           256K

(Continued on next page)
Supermicro
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Platform Notes (Continued)

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
aperfmpref eagerfpu nni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
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_notif hwp_act_window hwp_epp intel_pt rsb_ctxsx spec_ctrl retpoline
kaiser tpr_shadow vmmi flexnoprior epv vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1

/pro/cpupinfo 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: 63545 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:

    (Continued on next page)
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| SPECrate2017_int_base | 44.8 |
| SPECrate2017_int_peak | 48.0 |

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

Platform Notes (Continued)

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
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 34G 111G 24% /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

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
 CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
 557.xz_r(base)
==============================================================================
 icc (ICC) 18.0.2 20180210
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
 CC  500.perlbench_r(peak) 502.gcc_r(peak) 505.mcf_r(peak) 525.x264_r(peak)
 557.xz_r(peak)
==============================================================================
 icc (ICC) 18.0.2 20180210
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
 541.leela_r(base)
(Continued on next page)
Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)
### SPEC CPU2017 Integer Rate Result

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

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| SPECRate2017_int_base = 44.8 | SPECRate2017_int_peak = 48.0 |

**Base Portability Flags (Continued)**

520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

**Base Optimization Flags**

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-L/usr/local/je5.0.1-64/lib -ljemalloc

**Peak Compiler Invocation**

C benchmarks (except as noted below):
icc -m64 -std=c11

502.gcc_r:icc -m32 -std=c11 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m64

523.xalancbmk_r:icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64
Supermicro
SuperWorkstation 5039C-T (X11SCA, Intel Core i7-9700K)

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

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc
502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc
505.mcf_r: basepeak = yes
525.x264_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc
557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes
523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc
531.deepsjeng_r: basepeak = yes
541.leela_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3

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**Test Sponsor:** Supermicro

**Software Availability:** Mar-2018

## Peak Optimization Flags (Continued)

```bash
541.leela_r (continued):
-L/usr/local/jemalloc
```

**Fortran benchmarks:**

```bash
548.exchange2_r: 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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