## SPEC® CPU2017 Integer Speed Result

**Supermicro**  
SuperWorkstation 5039A-i (X11SRA, Intel Xeon W-2155)

### Software
- **OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64)  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
  Fortran: Version 18.0.0.128 of Intel Fortran  
- **Firmware:** Supermicro BIOS version 1.2 released Aug-2018  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator library V5.0.1

### Hardware
- **CPU Name:** Intel Xeon W-2155  
- **Max MHz.:** 4500  
- **Nominal:** 3300  
- **Enabled:** 10 cores, 1 chip  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
  L2: 1 MB I+D on chip per core  
  L3: 13.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 64 GB (4 x 16 GB 2Rx4 PC4-2666V-E)  
- **Storage:** 1 x 200 GB SATA III SSD  
- **Other:** None  

### CPU2017 License: 001176  
**Test Date:** Sep-2018  
**Test Sponsor:** Supermicro  
**Hardware Availability:** Jul-2017  
**Software Availability:** Feb-2018

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>10</td>
<td>7.23</td>
<td>10.0</td>
</tr>
<tr>
<td>gcc_s</td>
<td>10</td>
<td>8.57</td>
<td>10.5</td>
</tr>
<tr>
<td>mcf_s</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>10</td>
<td>5.90</td>
<td></td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x264_s</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>10</td>
<td>6.20</td>
<td></td>
</tr>
<tr>
<td>leela_s</td>
<td>10</td>
<td>5.26</td>
<td>16.3</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xz_s</td>
<td>10</td>
<td>5.28</td>
<td>15.5</td>
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### SPECspeed2017_int_base = 9.71

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<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>600.perlbench_s</td>
<td>10</td>
<td>246</td>
<td>7.23</td>
<td>244</td>
<td>7.26</td>
<td><strong>245</strong></td>
<td><strong>7.23</strong></td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>10</td>
<td><strong>378</strong></td>
<td><strong>10.5</strong></td>
<td>378</td>
<td>10.5</td>
<td>10</td>
<td><strong>370</strong></td>
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<tr>
<td>605.mcf_s</td>
<td>10</td>
<td>360</td>
<td>13.1</td>
<td>359</td>
<td>13.2</td>
<td>10</td>
<td>357</td>
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<tr>
<td>620.omnetpp_s</td>
<td>10</td>
<td>276</td>
<td>5.90</td>
<td><strong>276</strong></td>
<td><strong>5.90</strong></td>
<td>10</td>
<td>276</td>
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<tr>
<td>623.xalanchmk_s</td>
<td>10</td>
<td>127</td>
<td>11.2</td>
<td><strong>127</strong></td>
<td><strong>11.2</strong></td>
<td>10</td>
<td>117</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>10</td>
<td>127</td>
<td>13.9</td>
<td><strong>127</strong></td>
<td><strong>13.9</strong></td>
<td>10</td>
<td>127</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>10</td>
<td>231</td>
<td>6.20</td>
<td>231</td>
<td>6.20</td>
<td>10</td>
<td>231</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>10</td>
<td>325</td>
<td>5.26</td>
<td>324</td>
<td>5.26</td>
<td>10</td>
<td>323</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>10</td>
<td>180</td>
<td>16.3</td>
<td><strong>180</strong></td>
<td><strong>16.3</strong></td>
<td>10</td>
<td>182</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>10</td>
<td>404</td>
<td>15.3</td>
<td>405</td>
<td>15.3</td>
<td>10</td>
<td>400</td>
</tr>
</tbody>
</table>

**Results 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,scatter"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
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

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;

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.
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Tested by: Supermicro

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Platform Notes

BIOS Settings:
Hyper-Threading [ALL] = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on linux-k7zv Thu Sep 6 18:32:25 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) W-2155 CPU @ 3.30GHz
 1 "physical id"s (chips)
 10 "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 : 10
siblings  : 10
physical 0: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture:           x86_64
CPU op-mode(s):         32-bit, 64-bit
Byte Order:             Little Endian
CPU(s):                 10
On-line CPU(s) list:    0-9
Thread(s) per core:     1
Core(s) per socket:     10
Socket(s):              1
NUMA node(s):           1
Vendor ID:              GenuineIntel
CPU family:             6
Model:                  85
Model name:             Intel(R) Xeon(R) W-2155 CPU @ 3.30GHz
Stepping:               4
CPU MHz:                1600.000
CPU max MHz:            4500.0000
CPU min MHz:            1200.0000
BogoMIPS:               6623.84
Virtualization:         VT-x
L1d cache:              32K
L1i cache:              32K
L2 cache:               1024K
L3 cache:               14080K
NUMA node0 CPU(s):      0-9
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 nopl xtopology nonstop_tsc
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xprtd pdcmm pcd cm dca 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 intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vmx flexpriority
ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavex xgetbv1 cqm_llc cqm_occup_llc
dacache data
cache size: 14080 KB
```

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 1 nodes (0)
nodex xcpu: 0 1 2 3 4 5 6 7 8 9
node xsize: 64120 MB
node xfree: 63591 MB
node xdistances:
node 0
0: 10
```

From `/proc/meminfo`

```
MemTotal: 65659100 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-k7zv 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
```

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**Platform Notes (Continued)**

run-level 3 Sep 6 18:31

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs   145G   31G  114G  22% /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. 1.2 08/23/2018

Memory:
4x Micron 18ADF2G72AZ-2G6H1R 16 GB 2 rank 2666
4x NO DIMM NO DIMM

(End of data from sysinfo program)

---

**Compiler Version Notes**

```
```

---

```cpp
```
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Compiler Version Notes (Continued)

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
---------------------------------------------------------------------

FC 648.exchange2_s(base, peak)
---------------------------------------------------------------------

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
---------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
iccc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

(Continued on next page)
## Base Optimization Flags (Continued)

C++ benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

## Base Other Flags

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

C++ benchmarks:
- `-m64`

Fortran benchmarks:
- `-m64`

## Peak Compiler Invocation

C benchmarks:
- `icc`

C++ benchmarks:
- `icpc`

Fortran benchmarks:
- `ifort`

## Peak Portability Flags

- `600.perlbench_s -DSPEC_LP64 -DSPEC_LINUX_X64`
- `602.gcc_s -DSPEC_LP64`
- `605.mcf_s -DSPEC_LP64`
- `620.omnetpp_s -DSPEC_LP64`
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Peak Portability Flags (Continued)

623.xalancbmk_s: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -fno-strict-overflow
-L/usr/local/je5.0.1-64/lib -ljemalloc

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-32/lib -ljemalloc

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

631.deepsjeng_s: basepeak = yes

641.leela_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Other Flags

C benchmarks:
-m64 -std=c11

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

623.xalancbmk_s: -m32

Fortran benchmarks:
-m64

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-BSF-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-BSF-revA.xml

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

Tested with SPEC CPU2017 v1.0.2 on 2018-09-06 06:32:24-0400.
Originally published on 2018-10-16.