Supermicro
SuperServer 5019C-WR (X11SCW-F , Intel Xeon E-2124G)

SPEC CPU®2017 Integer Speed Result

SPECspeed®2017_int_base = 10.1
SPECspeed®2017_int_peak = 10.4

Threads

600.perlbench_s 4
602.gcc_s 4
605.mcf_s 4
620.omnetpp_s 4
623.xalancbmk_s 4
625.x264_s 4
631.deepsjeng_s 4
641.leela_s 4
648.exchange2_s 4
657.xz_s 4

--- SPECspeed®2017_int_base (10.1) ---

--- SPECspeed®2017_int_peak (10.4) ---

Hardware
CPU Name: Intel Xeon E-2124G
Max MHz: 4500
Nominal: 3400
Enabled: 4 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: 8 MB I+D on chip per chip
Other: None
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 19.0.1.144 of Intel C/C++
            Compiler for Linux;
            Fortran: Version 19.0.1.144 of Intel Fortran
            Compiler for Linux
Parallel: Yes
Firmware: Version 1.0b released May-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other:jemalloc memory allocator V5.0.1
Power Management: --
Supermicro
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Results Table

| Benchmark   | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |  | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
|-------------|---------|---------|-------|---------|-------|---------|-------| |         |         |       |         |       |         |       |
| 600.perlbench_s | 4       | 243     | 7.30  | 243     | 7.32 | 242     | 7.34 | | 4       | 206     | 8.61  | 206     | 8.60 | 206     | 8.60 |
| 602.gcc_s     | 4       | 340     | 11.7  | 340     | 11.7 | 339     | 11.7 | | 4       | 330     | 12.1  | 330     | 12.1 | 331     | 12.0 |
| 605.mcf_s     | 4       | 306     | 15.4  | 306     | 15.5 | 304     | 15.5 | | 4       | 304     | 15.6  | 304     | 15.5 | 304     | 15.5 |
| 620.omnetpp_s | 4       | 230     | 7.08  | 229     | 7.12 | 231     | 7.08 | | 4       | 230     | 7.08  | 229     | 7.12 | 231     | 7.08 |
| 623.xalanchmk_s | 4    | 97.0    | 14.6  | 97.2    | 14.6 | 97.3    | 14.6 | | 4       | 97.0    | 14.6  | 97.2    | 14.6 | 97.3    | 14.6 |
| 625.x264_s    | 4       | 104     | 16.9  | 104     | 16.9 | 104     | 16.9 | | 4       | 104     | 16.9  | 104     | 16.9 | 104     | 16.9 |
| 631.deepsjeng_s | 4      | 223     | 6.44  | 222     | 6.44 | 222     | 6.44 | | 4       | 223     | 6.44  | 222     | 6.44 | 223     | 6.44 |
| 641.leela_s   | 4       | 318     | 5.36  | 318     | 5.36 | 318     | 5.36 | | 4       | 318     | 5.36  | 318     | 5.36 | 318     | 5.36 |
| 648.exchange2_s | 4     | 183     | 16.0  | 183     | 16.0 | 183     | 16.1 | | 4       | 183     | 16.0  | 183     | 16.1 | 183     | 16.1 |
| 657.xz_s      | 4       | 693     | 8.92  | 693     | 8.92 | 693     | 8.92 | | 4       | 679     | 9.10  | 679     | 9.11 | 680     | 9.10 |

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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"
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 i9-7900X 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.
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CPU2017 License: 001176
Test Sponsor: Supermicro
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 SPEC CPU®2017 Integer Speed Result
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SPECspeed®2017_int_base = 10.1
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Platform Notes
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd0f2999c33d61f64985e45859ea9
running on linux-65nv Sat Aug 17 03:43:56 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) Xeon(R) E-2124G CPU @ 3.40GHz
       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-2124G CPU @ 3.40GHz
   Stepping:           10
   CPU MHz:            4282.924
   CPU max MHz:        4500.0000
   CPU min MHz:        800.0000
   BogoMIPS:           6815.97
   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
                       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)
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_ess 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 xsaveopt xsaves xgetbv1

/proc/cpuinfo
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: 64333 MB
node 0 free: 50623 MB
node distances:
node 0
: 10

From /proc/meminfo
MemTotal:       65877980 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

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SPECspeed\textsuperscript{®}2017\textsubscript{int_base} = 10.1
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Aug-2019
Hardware Availability: Nov-2018
Software Availability: Nov-2018

Platform Notes (Continued)

CVE-2017-5753 (Spectre variant 1): Mitigation: Barriers
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB
run-level 3 Aug 16 16:48

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 145G 25G 120G 18% /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. 1.0b 05/16/2019
Memory:
4x Micron 18ADF2G72AZ-2G6H1R 16 GB 2 rank 2667

(End of data from sysinfo program)

Compiler Version Notes

<table>
<thead>
<tr>
<th>Language</th>
<th>Version Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
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</tr>
</tbody>
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Intel\textsuperscript{(R)} C Intel\textsuperscript{(R)} 64 Compiler for applications running on Intel\textsuperscript{(R)} 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

<table>
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<tr>
<th>C++</th>
<th>620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)</th>
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<tr>
<td></td>
<td>631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</td>
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<tr>
<th>Fortran</th>
<th>648.exchange2_s(base, peak)</th>
</tr>
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Intel\textsuperscript{(R)} Fortran Intel\textsuperscript{(R)} 64 Compiler for applications running on Intel\textsuperscript{(R)} 64, Version 19.0.1.144 Build 20181018
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<td>Hardware Availability: Nov-2018</td>
</tr>
<tr>
<td>Tested by: Supermicro</td>
<td>Software Availability: Nov-2018</td>
</tr>
</tbody>
</table>

Base Compiler Invocation

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

C++ benchmarks:
```bash
icpc -m64
```

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

Base Portability Flags

```bash
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:
```bash
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

C++ benchmarks:
```bash
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc
```

Fortran benchmarks:
```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs
```
## SPEC CPU®2017 Integer Speed Result

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<tbody>
<tr>
<td>10.1</td>
<td>10.4</td>
</tr>
</tbody>
</table>

### Peak Compiler Invocation

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

- **C++ benchmarks:**
  - `icpc -m64`

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

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

- **C benchmarks:**
  - `600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2`
  - `xCORE-AVX2 -qopt-mem-layout-trans=4 -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-AVX2 -qopt-mem-layout-trans=4 -ipo -O3`
  - `-no-prec-div -DSPEC_SUPPRESS_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-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4`
  - `-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP`
  - `-L/usr/local/je5.0.1-64/lib -ljemalloc`

  - `625.x264_s: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP`
  - `-L/usr/local/je5.0.1-64/lib -ljemalloc`

  - `657.xz_s: -Wl,-z,muldefs -xCORE-AVX2 -qopt-mem-layout-trans=4 -ipo -O3`
  - `-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp`
  - `-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

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Test Sponsor: Supermicro
Test Date: Aug-2019
Tested by: Supermicro
Hardware Availability: Nov-2018
Software Availability: Nov-2018

Peak Optimization Flags (Continued)

C++ benchmarks:

620.omnetpp_s:basepeak = yes
623.xalancbmk_s:basepeak = yes
631.deepsjeng_s:basepeak = yes
641.leela_s:basepeak = yes

Fortran benchmarks:

-xCORE-AVX2  -ipo  -O3  -no-prec-div  -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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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