### Hardware
- **CPU Name:** Intel Xeon E-2176G
- **Max MHz.:** 4700
- **Nominal:** 3700
- **Enabled:** 6 cores, 1 chip, 2 threads/core
- **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
- **Other:** None
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
- **Storage:** 1 x 960 GB SATA SSD, RAID 0
- **Other:** None

### Software
- **OS:** SUSE Linux Enterprise Server 15
- **Kernel:** 4.12.14-23-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 Compiler for Linux
- **Parallel:** No
- **Firmware:** HPE BIOS Version U44 08/15/2018 released Aug-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** jemalloc memory allocator v5.0.1

### Copies
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<thead>
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<th>SPECrate2017_int_base = 40.9</th>
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<tbody>
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<tr>
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<tr>
<td>520.omnetpp_r</td>
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<tr>
<td>523.xalancbmk_r</td>
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<tr>
<td>525.x264_r</td>
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<tr>
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<tr>
<td>541.leela_r</td>
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<tr>
<td>548.exchange2_r</td>
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<tr>
<td>557.xz_r</td>
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**Test Sponsor:** HPE

**Test Date:** Oct-2018

**Hardware Availability:** Nov-2018

**Software Availability:** Jul-2018
**Results Table**

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</tbody>
</table>

**Submit Notes**

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate tasksset 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"
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`
IRQ balance service was stopped using "systemctl stop irqbalance.service"
Tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"
VM Dirty ratio was set to 40 using "echo 40 > /proc/sys/vm/dirty_ratio"

**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

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)
Hewlett Packard Enterprise

ProLiant ML30 Gen10
(3.70 GHz, Intel Xeon E-2176G)

SPECrate2017_int_base = 40.9
SPECrate2017_int_peak = Not Run

General Notes (Continued)
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.

Platform Notes

BIOS Configuration:
Thermal Configuration set to Maximum Cooling
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Workload Profile set to General Throughput Compute
Minimum Processor Idle Power Core C-State set to C1E State
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on ml30-sles15-mk Mon Oct 1 10:29:57 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-2176G CPU @ 3.70GHz
  1 "physical id"s (chips)
  12 "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 : 6
siblings : 12
physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 2
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML30 Gen10
(3.70 GHz, Intel Xeon E-2176G)

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CPU2017 License: 3  Test Date: Oct-2018
Test Sponsor: HPE  Hardware Availability: Nov-2018
Tested by: HPE  Software Availability: Jul-2018

<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
</table>

Model name: Intel(R) Xeon(R) E-2176G CPU @ 3.70GHz
Stepping: 10
CPU MHz: 3700.000
BogoMIPS: 7392.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-11
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref tsc_known_freq pni 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 cpuid_fault epb invpcid_single
pti tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsavec
xgetbv1 xsaves ibpb ibrs stibp dtherm ida arat pln pts ssbd

/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 8 9 10 11
  node 0 size: 64264 MB
  node 0 free: 44924 MB
  node distances:
  node 0
  0: 10

From /proc/meminfo
- MemTotal: 65807088 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- os-release:
  NAME="SLES"
  VERSION="15"
  VERSION_ID="15"
  PRETTY_NAME="SUSE Linux Enterprise Server 15"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"

(Continued on next page)
SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise  
(Test Sponsor: HPE) 
ProLiant ML30 Gen10  
(3.70 GHz, Intel Xeon E-2176G) 

SPECrate2017_int_base = 40.9 
SPECrate2017_int_peak = Not Run

CPU2017 License: 3 
Test Sponsor: HPE 
Tested by: HPE

SPECrates2017_int_base = 40.9 
SPECrates2017_int_peak = Not Run

Test Date: Oct-2018 
Hardware Availability: Nov-2018 
Software Availability: Jul-2018

Platform Notes (Continued)
CPE_NAME="cpe:/o:suse:sles:15"
uname -a:
    Linux ml30-sles15-mk 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Sep 28 15:19
SPEC is set to: /home/cpu2017
    Filesystem     Type  Size  Used  Avail Use% Mounted on 
    /dev/sdd5      xfs    751G   25G   726G   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 HPE U44 08/15/2018
    Memory: 
        4x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666, configured at 2667

(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.

==============================================================================
 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 
      541.leela_r(base)
==============================================================================
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

(Continued on next page)
SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML30 Gen10
(3.70 GHz, Intel Xeon E-2176G)

SPECrate2017_int_base = 40.9
SPECrate2017_int_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Compiler Version Notes (Continued)

==============================================================================
FC  548.exchange2_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
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

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**SPEC CPU2017 Integer Rate Result**

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<tr>
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<td>Software Availability: Jul-2018</td>
</tr>
</tbody>
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**Base Optimization Flags (Continued)**

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

The flags files that were used to format this result can be browsed at
- http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.html

You can also download the XML flags sources by saving the following links:
- http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml

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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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