## SPEC® CPU2017 Integer Rate Result

**Hewlett Packard Enterprise**  
*(Test Sponsor: HPE)*  
**Synergy 480 Gen10**  
*(1.80 GHz, Intel Xeon Gold 6222V)*

**SPECrate2017_int_base** = 198  
**SPECrate2017_int_peak** = Not Run

<table>
<thead>
<tr>
<th>Copies</th>
<th>Test Date: Jul-2019</th>
<th>Hardware Availability: Apr-2019</th>
<th>Software Availability: Feb-2019</th>
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</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>80</td>
<td>0</td>
<td>SPECrate2017_int_base (198)</td>
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<tr>
<td>502.gcc_r</td>
<td>169</td>
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<td>505.mcf_r</td>
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<td>520.omnetpp_r</td>
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<td>523.xalancbmk_r</td>
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<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>
<td>137</td>
<td>160</td>
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</tr>
</tbody>
</table>

### Hardware

**CPU Name:** Intel Xeon Gold 6222V  
**Max MHz.:** 3600  
**Nominal:** 1800  
**Enabled:** 40 cores, 2 chips, 2 threads/core  
**Orderable:** 1, 2 chip(s)  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**Cache L2:** 1 MB I+D on chip per core  
**Cache L3:** 27.5 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2400)  
**Storage:** 1 x 400 GB SAS SSD, RAID 0  
**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 15 (x86_64)  
**Kernel:** 4.12.14-23-default  
**Compiler:** C/C++: Version 19.0.2.187 of Intel C/C++  
**Compiler Build:** 20190117 for Linux; Fortran: Version 19.0.2.187 of Intel Fortran  
**Compiler Build:** 20190117 for Linux  
**Parallel:** No  
**Firmware:** HPE BIOS Version I42 04/18/2019 released Apr-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None
SPEC CPU2017 Integer Rate Result

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(Test Sponsor: HPE)
Synergy 480 Gen10
(1.80 GHz, Intel Xeon Gold 6222V)

SPECrate2017_int_base = 198
SPECrate2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
<td>531.deepsjeng_r</td>
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<td>561</td>
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<tr>
<td>548.exchange2_r</td>
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<td>Peak</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
| SPECrate2017_int_base = 198
SPECrate2017_int_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
NA: 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)
## SPEC CPU2017 Integer Rate Result

### Hewlett Packard Enterprise

**Test Sponsor:** HPE  
**Synergy 480 Gen10**  
**(1.80 GHz, Intel Xeon Gold 6222V)**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
<th>Test Date:</th>
<th>Jul-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
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<td>Feb-2019</td>
</tr>
</tbody>
</table>

### SPECrate2017_int_base = 198

### SPECrate2017_int_peak = Not Run

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**General Notes (Continued)**

is mitigated in the system as tested and documented.

### Platform Notes

**BIOS Configuration:**
- Thermal Configuration set to Maximum Cooling
- Memory Patrol Scrubbing set to Disabled
- LLC Prefetch set to Enabled
- LLC Dead Line Allocation set to Disabled
- Enhanced Processor Performance set to Enabled
- Workload Profile set to General Throughput Compute
- Workload Profile set to Custom
- Energy/Performance Bias set to Balanced Performance

**Sysinfo program** /home/cpu2017_u2/bin/sysinfo  
**Rev:** r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
**running on sy480-gen10 Wed Jul 3 15:38:41 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) Gold 6222V CPU @ 1.80GHz  
  - 2 "physical id"s (chips)  
  - 80 "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 : 20  
  - siblings : 40
- **physical 0:** cores 0 1 2 3 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28  
  - physical 1: cores 0 1 2 3 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

**From lscpu:**

- **Architecture:** x86_64  
- **CPU op-mode(s):** 32-bit, 64-bit  
- **Byte Order:** Little Endian  
- **CPU(s):** 80  
- **On-line CPU(s) list:** 0-79  
- **Thread(s) per core:** 2  
- **Core(s) per socket:** 20  
- **Socket(s):** 2  
- **NUMA node(s):** 4  
- **Vendor ID:** GenuineIntel  
- **CPU family:** 6  
- **Model:** 85  
- **Model name:** Intel(R) Xeon(R) Gold 6222V CPU @ 1.80GHz

(Continued on next page)
SPEC CPU2017 Integer Rate Result

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

Test Date: Jul-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Platform Notes (Continued)

Stepping: 7
CPU MHz: 1800.000
BogoMIPS: 3600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-9,40-49
NUMA node1 CPU(s): 10-19,50-59
NUMA node2 CPU(s): 20-29,60-69
NUMA node3 CPU(s): 30-39,70-79
Flags: fpu vme de pse 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 monit ds_cpl vmx smx est tm2 ssse3
sdmb fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault
epb cat_l3 cdp_l3 invpcid_single intel_pppin mba tpr_shadow vnni flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ersed invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsaves xgetbv1 x saves cqm_llc cqm_occup llc cqm_mbm total cqm_mbm local
ibpb ibrs stibp dtcme ida arat pln pts pkp ospe avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data

cache size : 28160 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 40 41 42 43 44 45 46 47 48 49
node 0 size: 96249 MB
node 0 free: 95946 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59
node 1 size: 96764 MB
node 1 free: 96592 MB
node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69
node 2 size: 96764 MB
node 2 free: 96570 MB
node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79
node 3 size: 96565 MB
node 3 free: 96317 MB
node distances:
node 0 1 2 3
0: 10 21 31 31
1: 21 10 31 31
2: 31 31 10 21

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3: 31 31 21 10</td>
</tr>
<tr>
<td>From /proc/meminfo</td>
</tr>
<tr>
<td>MemTotal: 395615660 kB</td>
</tr>
<tr>
<td>HugePages_Total: 0</td>
</tr>
<tr>
<td>Hugepagesize: 2048 kB</td>
</tr>
<tr>
<td>From /etc/<em>release</em>/etc/<em>version</em></td>
</tr>
<tr>
<td>os-release:</td>
</tr>
<tr>
<td>NAME=“SLES”</td>
</tr>
<tr>
<td>VERSION=“15”</td>
</tr>
<tr>
<td>VERSION_ID=“15”</td>
</tr>
<tr>
<td>PRETTY_NAME=“SUSE Linux Enterprise Server 15”</td>
</tr>
<tr>
<td>ID=“sles”</td>
</tr>
<tr>
<td>ID_LIKE=“suse”</td>
</tr>
<tr>
<td>ANSI_COLOR=“0;32”</td>
</tr>
<tr>
<td>CPE_NAME=“cpe:/o:suse:sles:15”</td>
</tr>
<tr>
<td>uname -a:</td>
</tr>
<tr>
<td>Linux sy480-gen10 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)</td>
</tr>
<tr>
<td>x86_64 x86_64 x86_64 GNU/Linux</td>
</tr>
</tbody>
</table>

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_PW

run-level 3 Jul 3 15:36

SPEC is set to: /home/cpu2017_u2

<table>
<thead>
<tr>
<th>Filesystem</th>
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<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>xfs</td>
<td>405G</td>
<td>248G</td>
<td>158G</td>
<td>62%</td>
<td>/home</td>
</tr>
</tbody>
</table>

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 I42 04/18/2019
Memory:
24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)
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**SPECrate2017_int_base** = 198

**SPECrate2017_int_peak** = Not Run

---

**Compiler Version Notes**

```
==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
      557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
FC  548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 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
```

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Base Portability Flags (Continued)

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-AVX512 -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

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -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:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

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-CLX-revB.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 v1.0.5 on 2019-07-03 16:38:41-0400.
Report generated on 2019-07-03 16:34:31 by CPU2017 PDF formatter v6067.