# SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2234)

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**SPECrater®2017_int_base = 34.6**

**SPECrater®2017_int_peak = Not Run**

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_base (34.6)</th>
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<td></td>
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<tr>
<td>502.gcc_r</td>
<td>8</td>
<td></td>
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<td>520.omnetpp_r</td>
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<td></td>
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<tr>
<td>523.xalancbmk_r</td>
<td>8</td>
<td></td>
</tr>
<tr>
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<td>8</td>
<td></td>
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<tr>
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<td>8</td>
<td></td>
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<td>8</td>
<td></td>
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<td>8</td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

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### Hardware

- **CPU Name:** Intel Xeon E-2234
- **Max MHz:** 4800
- **Nominal:** 3600
- **Enabled:** 4 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:** 8 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-U)
- **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 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux;
  Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux;
- **Parallel:** No
- **Firmware:** HPE BIOS Version U44 09/05/2019 released Nov-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
- **Power Management:** --
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>77.1</td>
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<td>557.xz_r</td>
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<td>20.4</td>
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<td>20.4</td>
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</tbody>
</table>

**SPECrate®2017_int_base = 34.6**  
**SPECrate®2017_int_peak = Not Run**

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

### 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"

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = 
"/home/cpu2017_u4/lib/intel64:/home/cpu2017_u4/lib/ia32:/home/cpu2017_u4
/je5.0.1-32"
```

### General Notes

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
```

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## SPEC CPU®2017 Integer Rate Result

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(Test Sponsor: HPE)  
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<tr>
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<td>HPE</td>
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<td>Tested by:</td>
<td>HPE</td>
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### General Notes (Continued)

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.

### Platform Notes

**BIOS Configuration:**
- Thermal Configuration set to Maximum Cooling
- LLC Prefetch set to Enabled
- Workload Profile set to General Throughput Compute

Sysinfo program /home/cpu2017_u4/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011  
running on ml30-sles15 Sat Oct 5 02:51:04 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-2234 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 : 4  
  siblings : 8  
  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): 8  
On-line CPU(s) list: 0-7  
Thread(s) per core: 2  
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-2234 CPU @ 3.60GHz
```

(Continued on next page)
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CPU2017 License: 3
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SPECrate®2017_int_base = 34.6
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Platform Notes (Continued)

Stepping: 10
CPU MHz: 3600.000
BogoMIPS: 7200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-7
Flags:
   fpu vme de pse tsc msr pae mca cmov
   pat pse36 clflush dtc 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
   aperfmperf 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 vmmi 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

From /proc/cpuinfo cache data
   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 4 5 6 7
   node 0 size: 64266 MB
   node 0 free: 63770 MB
   node distances:
      node 0
         0: 10

From /proc/meminfo
   MemTotal: 65808748 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"
      CPE_NAME="cpe:/o:suse:sles:15"

(Continued on next page)
Platform Notes (Continued)

uname -a:
   Linux ml30-sles15 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-2018-3620 (L1 Terminal Fault): No status reported
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass): Vulnerable
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 Oct 5 02:49

SPEC is set to: /home/cpu2017_u4
    Filesystem   Type  Size  Used Avail Use% Mounted on
    /dev/sda3    xfs   344G   68G  276G  20% /home

From /sys/devices/virtual/dmi/id
    BIOS:        HPE U44 09/05/2019
    Vendor:      HPE
    Product:     ProLiant ML30 Gen10
    Product Family:  ProLiant
    Serial:      CN68130P0X

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.
    Memory: 4x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666, configured at 2667

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
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Compiler Version Notes (Continued)

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<tbody>
<tr>
<td>C benchmarks:</td>
</tr>
<tr>
<td>icc -m64 -std=c11</td>
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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
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Sep-2019  
**Hardware Availability:** Nov-2019  
**Software Availability:** May-2019

**Base Optimization Flags**

C benchmarks:
- -Wl,-z,muldefs  
- -xCORE-AVX2  
- -ipo  
- -O3  
- -no-prec-div  
- -qopt-mem-layout-trans=4  
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64  
- -lqkmalloc

C++ benchmarks:
- -Wl,-z,muldefs  
- -xCORE-AVX2  
- -ipo  
- -O3  
- -no-prec-div  
- -qopt-mem-layout-trans=4  
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64  
- -lqkmalloc

Fortran benchmarks:
- -Wl,-z,muldefs  
- -xCORE-AVX2  
- -ipo  
- -O3  
- -no-prec-div  
- -qopt-mem-layout-trans=4  
- -nostandard-realloc-lhs  
- -align array32byte  
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64  
- -lqkmalloc

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-CLX-revB.html](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.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-CLX-revB.xml](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.

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