Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL110 Gen10 Plus
(2.30 GHz, Intel Xeon Gold 6314U)

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

HPE

Test Date: Jun-2021
Hardware Availability: Jun-2021

Software
OS: Red Hat Enterprise Linux 8.3 (Ootpa)
Kernel 4.18.0-240.el8.x86_64

Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++
Compiler Build 20201113 for Linux;
Fortran: Version 2021.1 of Intel Fortran Compiler
Classic Build 20201112 for Linux;
C/C++: Version 2021.1 of Intel C/C++ Compiler
Classic Build 20201112 for Linux

Parallel: No
Firmware: HPE BIOS Version U56 v1.50 05/13/2021 released
May-2021

File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage

500.perlbench_r 64
502.gcc_r 64
505.mcf_r 64
520.omnetpp_r 64
523.xalancbmk_r 64
525.x264_r 64
531.deepsjeng_r 64
541.leela_r 64
548.exchange2_r 64
557.xz_r 64

SPECrate®2017_int_base = 226
SPECrate®2017_int_peak = 234

Hardware
CPU Name: Intel Xeon Gold 6314U
Max MHz: 3400
Nominal: 2300
Enabled: 32 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 48 MB I+D on chip per chip
Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 480 GB NVMe SSD, RAID 0
Other: None
SPEC CPU®2017 Integer Rate Result

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Results Table

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</tbody>
</table>

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

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
  LD_LIBRARY_PATH = "/cpu2017/lib/intel64:/cpu2017/lib/ia32:/cpu2017/je5.0.1-32"
  MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1
runcpu command invoked through numactl i.e.:
  numactl --interleave=all runcpu <etc>

(Continued on next page)
**General Notes (Continued)**

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) is mitigated in the system as tested and documented.


Submitted by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>
Submitted: Mon Jun 21 10:34:24 EDT 2021
Submission: cpu2017-20210621-27601.sub

**Platform Notes**

The system ROM used for this result contains Intel microcode version 0xd0002a0 for the Intel Xeon Gold 6314U processor.

BIOS Configuration:
- Workload Profile set to General Throughput Compute
- Memory Patrol Scrubbing set to Disabled
- Advanced Memory Protection set to Advanced ECC
- XPT Remote Prefetcher set to Enabled
- Last Level Cache (LLC) Dead Line Allocation set to Disabled
- Enhanced Processor Performance set to Enabled
- Enhanced Processor Performance Profile set to Aggressive
- Thermal Configuration set to Maximum Cooling
- Workload Profile set to Custom
- DCU Stream Prefetcher set to Disabled
- Energy Efficient Turbo set to Enabled
- Adjacent Sector Prefetcher set to Disabled

Sysinfo program /cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost.localdomain Thu Jun 17 06:12:58 2021

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 6314U CPU @ 2.30GHz
- 1 "physical id"s (chips)
- 64 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

Hewlett Packard Enterprise  
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SPECrate®2017_int_base = 226  
SPECrate®2017_int_peak = 234

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<th>Test Date:</th>
<th>Jun-2021</th>
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<tr>
<td>Tested by: HPE</td>
<td>Software Availability:</td>
<td>Jun-2021</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

cpu cores : 32  
siblings : 64  
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

From lscpu from util-linux 2.32.1:

- Architecture: x86_64  
- CPU op-mode(s): 32-bit, 64-bit  
- Byte Order: Little Endian  
- CPU(s): 64  
- On-line CPU(s) list: 0-63  
- Thread(s) per core: 2  
- Core(s) per socket: 32  
- Socket(s): 1  
- NUMA node(s): 2  
- Vendor ID: GenuineIntel  
- CPU family: 6  
- Model: 106  
- Model name: Intel(R) Xeon(R) Gold 6314U CPU @ 2.30GHz  
- Stepping: 6  
- CPU MHz: 3187.500  
- BogoMIPS: 4600.00  
- Virtualization: VT-x  
- L1d cache: 48K  
- L1i cache: 32K  
- L2 cache: 1280K  
- L3 cache: 49152K  
- NUMA node0 CPU(s): 0-15,32-47  
- NUMA node1 CPU(s): 16-31,48-63  
- 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 cpuid
  - aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
  - xptr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
  - avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebp cat_13 invpcid_single ssbd
  - mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
  - fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ermi invpcid cqm rdt_a avx512f avx512dq
  - rdseed adx smap avx512ifma ciflushopt clwb intel_pt avx512cd sha ni avx512bw
  - avx512vl xsavesopt xsaveopt xsaves xgetbv xsave xsaves cqm_llc cqm_occu_llc cqm_mbm_total
  - cqm_mbm_local split_lock_detect wbnoinvd dtherm ida arat pni pts avx512vbmi umip pk
  - ospke avx512_vnni2 gfn1 vaes vpcmldqdx avx512_vni avx512_bitalg tme
  - avx512_vpopcntdq la57 rdpid md_clear pconfi flush_lld arch_capabilities

/proc/cpuinfo cache data  

- cache size : 49152 KB

From numactl --hardware
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL110 Gen10 Plus
(2.30 GHz, Intel Xeon Gold 6314U)

| SPECrate®2017_int_base = 226 |
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POWER2017 License: 3
Test Sponsor: HPE
Tested by: HPE

CPU2017 License: 3
Test Date: Jun-2021
Test Sponsor: HPE
Hardware Availability: Jun-2021
Tested by: HPE
Software Availability: Jun-2021

Platform Notes (Continued)

WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43
44 45 46 47
node 0 size: 246386 MB
node 0 free: 257005 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
57 58 59 60 61 62 63
node 1 size: 247318 MB
node 1 free: 256540 MB
node distances:
node 0 1
0: 10 20
1: 20 10

From /proc/meminfo
MemTotal: 528044728 kB
 HugePages_Total: 0
 Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: throughput-performance

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.3 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.3"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
ANS1_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
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| SPECrate®2017_int_base = 226 |
| SPECrate®2017_int_peak = 234 |

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

Platform Notes (Continued)

CVE-2018-3639 (Speculative Store Bypass):
Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):
Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Jun 17 06:05

SPEC is set to: /cpu2017

From /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL110 Gen10 Plus
Product Family: ProLiant
Serial: T912PP0032

Additional information from dmidecode 3.2 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:
8x Micron 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200

BIOS:
BIOS Vendor: HPE
BIOS Version: U56
BIOS Date: 05/13/2021
BIOS Revision: 1.50
Firmware Revision: 2.40

(End of data from sysinfo program)

Compiler Version Notes

=================================================================================
C | 500.perlbench_r(peak)
=================================================================================

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
(Continued on next page)
Hewlett Packard Enterprise  
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(2.30 GHz, Intel Xeon Gold 6314U)  

**SPEC CPU®2017 Integer Rate Result**  
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**SPECrate®2017_int_base = 226**  
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**Compiler Version Notes (Continued)**

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<tr>
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</tr>
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(Continued on next page)
### Compiler Version Notes (Continued)

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**Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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<table>
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<th>502.gcc_r(peak)</th>
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**Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113**

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<table>
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<th>C</th>
<th>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)</th>
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**Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113**

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**Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113**

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**Fortran | 548.exchange2_r(base, peak)**

**Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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### Base Compiler Invocation

C benchmarks:

*icc*
SPEC CPU®2017 Integer Rate Result

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

Base Compiler Invocation (Continued)

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

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:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-1qkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-1qkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-1qkmalloc
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL110 Gen10 Plus
(2.30 GHz, Intel Xeon Gold 6314U)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 226
SPECrate®2017_int_peak = 234

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

500.perlbench_r: icc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL110 Gen10 Plus
(2.30 GHz, Intel Xeon Gold 6314U)

SPECrate®2017_int_base = 226
SPECrate®2017_int_peak = 234

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE
Test Date: Jun-2021
Hardware Availability: Jun-2021
Software Availability: Jun-2021

Peak Optimization Flags (Continued)

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L /opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc
557.xz_r: basepeak = yes

C++ benchmarks:
520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes
531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:
548.exchange2_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.0-ICX-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.0-ICX-revC.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

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Tested with SPEC CPU®2017 v1.1.8 on 2021-06-17 07:12:57-0400.
Report generated on 2021-07-06 18:36:58 by CPU2017 PDF formatter v6442.
Originally published on 2021-07-06.