SPEC® CPU2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(2.20 GHz, Intel Xeon Platinum 8253)

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

| SPECspeed2017_int_base = 7.88 |
| SPECspeed2017_int_peak = Not Run |

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

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--- SPECspeed2017_int_base (7.88) ---

Hardware

CPU Name: Intel Xeon Platinum 8253
Max MHz.: 3000
Nominal: 2200
Enabled: 64 cores, 4 chips
Orderable: 1, 2, 3, 4 chip(s)
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I-D on chip per core
L3: 22 MB I+D on chip per chip
Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
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: Yes
Firmware: HPE BIOS Version U34 04/19/2019 released Apr-2019
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
**SPEC CPU2017 Integer Speed Result**

**Hewlett Packard Enterprise**

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ProLiant DL580 Gen10

(2.20 GHz, Intel Xeon Platinum 8253)

---

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

---

**Results Table**

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</table>

**SPECspeed2017_int_base = 7.88**

**SPECspeed2017_int_peak = Not Run**

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**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
  ```

---

**General Notes**

- Environment variables set by runcpu before the start of the run:
  ```
  KMP_AFFINITY = "granularity=fine,scatter"
  LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64:
  /home/cpu2017_u2/je5.0.1-32:/home/cpu2017_u2/je5.0.1-64"
  OMP_STACKSIZE = "192M"
  ```
- Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
- Environment 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) is mitigated in the system as tested and documented.
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

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

Platform Notes

BIOS Configuration:
  Hyper-Threading set to Disabled
  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 Peak Frequency Compute
  Minimum Processor Idle Power Core C-State set to C1E State
  Energy/Performance Bias set to Balanced Power
  Workload Profile set to Custom
  Numa Group Size Optimization set to Flat
  Advanced Memory Protection set to Advanced ECC

Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on dl580-sles15 Tue Jun 11 18:52:06 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) Platinum 8253 CPU @ 2.20GHz
  4 "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.)
    cpu cores : 16
    siblings : 16
    physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
  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: 1
  Core(s) per socket: 16
  Socket(s): 4
  NUMA node(s): 4
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 85

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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ProLiant DL580 Gen10
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SPECspeed2017_int_base = 7.88
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
Stepping: 6
CPU MHz: 2200.000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
NUMA node2 CPU(s): 32-47
NUMA node3 CPU(s): 48-63
Flags: fpu vme de pse tsc msr pae 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 aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fxsr intel_p cris mvme cmov ms rx lmx2 pclmulqdqILLA ds*cpl
Flags: fma cx16 xstate avx f16c rdrand lahf_lm lm cmp x2apic movbe popcnt

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 10 11 12 13 14 15
node 0 size: 193090 MB
node 0 free: 192677 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 193532 MB
node 1 free: 193372 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 2 size: 193532 MB
node 2 free: 193262 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
node 3 size: 193531 MB
node 3 free: 193255 MB
node distances:

node distances:
node 0 1 2 3
0: 10 21 21 21
1: 21 10 21 21

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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Tested by: HPE

Platform Notes (Continued)

2: 21 21 10 21
3: 21 21 21 10

From /proc/meminfo
MemTotal: 792256440 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"

uname -a:
Linux dl580-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-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 Jun 11 18:51

SPEC is set to: /home/cpu2017_u2

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 371G 87G 284G 24% /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 U34 04/19/2019
Memory:
24x UNKNOWN NOT AVAILABLE
24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2933

(End of data from sysinfo program)
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
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### Compiler Version Notes

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**CC**  
600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)  
657.xz_s(base)

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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.

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**CXXC**  
620.omnetpp_s(base) 623.xalanchmk_s(base) 631.deepsjeng_s(base)  
641.leela_s(base)

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Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.2.187 Build 20190117  
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**FC**  
648.exchange2_s(base)

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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.2.187 Build 20190117  
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### Base Compiler Invocation

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

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

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

---

### Base Portability Flags

- 600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64  
- 602.gcc_s: -DSPEC_LP64  
- 605.mcf_s: -DSPEC_LP64  
- 620.omnetpp_s: -DSPEC_LP64
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Base Portability Flags (Continued)

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:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/home/cpu2017_u2/je5.0.1-64/ -ljemalloc

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
-ljemalloc

Fortran benchmarks:
-xCORE-AVX512 -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
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.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-ic19.0u1-flags-linux64.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.

Tested with SPEC CPU2017 v1.0.5 on 2019-06-11 09:22:05-0400.