SPEC CPU® 2017 Integer Speed Results

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

SPEC Speed® 2017 Int_base = 11.9
SPEC Speed® 2017 Int_peak = 12.1

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

Threads

600.perlbench_s 72
602.gcc_s 72
605.mcf_s 72
620.omnetpp_s 72
623.xalancbmk_s 72
625.x264_s 72
631.deepsjeng_s 72
641.leela_s 72
648.exchange2_s 72
657.xz_s 72

Hardware
CPU Name: Intel Xeon Platinum 8352V
Max MHz: 3500
Nominal: 2100
Enabled: 72 cores, 2 chips
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 54 MB I+D on chip per chip
Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC4-3200AA-R, running at 2933)
Storage: 1 x 400 GB SAS SSD, RAID 0
Other: None

Software
OS: Red Hat Enterprise Linux 8.3 (Ootpa)
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: Yes
Firmware: HPE BIOS Version U46 v1.42 05/16/2021 released May-2021
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

SPECspeed®2017_int_base = 11.9
SPECspeed®2017_int_peak = 12.1

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>72</td>
<td>250</td>
<td>7.11</td>
<td>246</td>
<td>7.21</td>
<td>248</td>
<td>7.17</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>72</td>
<td>372</td>
<td>10.7</td>
<td>368</td>
<td>10.8</td>
<td>367</td>
<td>10.8</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>72</td>
<td>240</td>
<td>19.6</td>
<td>240</td>
<td>19.6</td>
<td>240</td>
<td>19.6</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>72</td>
<td>135</td>
<td>12.1</td>
<td>141</td>
<td>11.6</td>
<td>134</td>
<td>12.2</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>72</td>
<td>106</td>
<td>13.4</td>
<td>108</td>
<td>13.1</td>
<td>107</td>
<td>13.2</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>72</td>
<td>104</td>
<td>17.0</td>
<td>104</td>
<td>17.0</td>
<td>104</td>
<td>17.0</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>72</td>
<td>243</td>
<td>5.91</td>
<td>242</td>
<td>5.91</td>
<td>243</td>
<td>5.91</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>72</td>
<td>352</td>
<td>4.85</td>
<td>352</td>
<td>4.85</td>
<td>352</td>
<td>4.85</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>72</td>
<td>152</td>
<td>19.3</td>
<td>152</td>
<td>19.4</td>
<td>152</td>
<td>19.4</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>72</td>
<td>260</td>
<td>23.8</td>
<td>261</td>
<td>23.8</td>
<td>259</td>
<td>23.8</td>
</tr>
</tbody>
</table>

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

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:
    KMP_AFFINITY = "granularity=fine,scatter"
    LD_LIBRARY_PATH = "/home/cpu2017_1.1.8/lib/intel64:/home/cpu2017_1.1.8/je5.0.1-64"
    MALLOC_CONF = "retain:true"
    OMP_STACKSIZE = "192M"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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.
jemalloc, a general purpose malloc implementation

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

SPECspeed®2017_int_base = 11.9
SPECspeed®2017_int_peak = 12.1

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

General Notes (Continued)

Built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
Sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

Submitted by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>
Submitted: Mon Aug 2 07:58:46 EDT 2021
Submission: cpu2017-20210802-28519.sub

Platform Notes

The system ROM used for this result contains Intel microcode version 0xd0002a0 for
the Intel Xeon Platinum 8352V processor.
BIOS Configuration:
Workload Profile set to General Peak Frequency Compute
Intel Hyper-Threading set to Disabled
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Advanced Memory Protection set to Advanced ECC
Last Level Cache (LLC) Prefetch set to Enabled
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Workload Profile set to Custom
  Energy/Performance Bias set to Balanced Power
  DCU Stream Prefetcher set to Disabled
  Adjacent Sector Prefetch set to Disabled
  Minimum Processor Idle Power Package C-State set to No Package State
  Numa Group Size Optimization set to Flat

Sysinfo program /home/cpu2017_1.1.8/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6c64d
running on localhost.localdomain Sat Jul 17 14:43:32 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) Platinum 8352V CPU @ 2.10GHz
  2 "physical id"s (chips)
  72 "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 : 36
siblings : 36
  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 32 33 34 35
  physical 1: 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
(Continued on next page)
SPEC CPU®2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

SPECspeed®2017_int_base = 11.9
SPECspeed®2017_int_peak = 12.1

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

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Platform Notes (Continued)

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): 72
On-line CPU(s) list: 0-71
Thread(s) per core: 1
Core(s) per socket: 36
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8352V CPU @ 2.10GHz
Stepping: 6
CPU MHz: 800.874
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 55296K
NUMA node0 CPU(s): 0-35
NUMA node1 CPU(s): 36-71
Flags: fpu vme de pse tsc msr pae mce 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

From numactl --hardware
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 16 17 18 19 20 21 22 23 24 25 26 27

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

CPU2017 License: 3
Test Date: Jul-2021
Test Sponsor: HPE
Hardware Availability: Jun-2021
Tested by: HPE
Software Availability: Dec-2020

SPECspeed®2017_int_base = 11.9
SPECspeed®2017_int_peak = 12.1

Platform Notes (Continued)

node 0 size: 975295 MB
node 0 free: 1031114 MB
node 1 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70 71
node 1 size: 974466 MB
node 1 free: 1031449 MB
node distances:
node 0 1
0: 10 20
1: 20 10

From /proc/meminfo
MemTotal: 2113487100 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)"
ANSI_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
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp

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

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

**SPECspeed®2017_int_base = 11.9**
**SPECspeed®2017_int_peak = 12.1**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
<th>Test Date:</th>
<th>Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
<td>Hardware Availability:</td>
<td>Jun-2021</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

---

**Platform Notes (Continued)**

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 Jul 17 14:42

SPEC is set to: /home/cpu2017_1.1.8

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel00-home</td>
<td>xfs</td>
<td>372G</td>
<td>232G</td>
<td>141G</td>
<td>63%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

Vendor: HPE
Product: ProLiant DL360 Gen10 Plus
Product Family: ProLiant
Serial: CN701108CQ

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:
32x Micron 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200, configured at 2933

BIOS:
BIOS Vendor: HPE
BIOS Version: U46
BIOS Date: 05/16/2021
BIOS Revision: 1.42
Firmware Revision: 2.42

(End of data from sysinfo program)

---

**Compiler Version Notes**

```c
600.perlbench_s(peak)
```

---

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
## Compiler Version Notes (Continued)

<table>
<thead>
<tr>
<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>625.x264_s(base, peak) 657.xz_s(base, peak)</td>
</tr>
</tbody>
</table>

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

| C       | 600.perlbench_s(peak)                                             |

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

<table>
<thead>
<tr>
<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>625.x264_s(base, peak) 657.xz_s(base, peak)</td>
</tr>
</tbody>
</table>

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

<table>
<thead>
<tr>
<th>C++</th>
<th>620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</td>
</tr>
</tbody>
</table>

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

| Fortran  | 648.exchange2_s(base, peak)                                      |

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

SPEC®2017 int_base = 11.9
SPEC®2017 int_peak = 12.1

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

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

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
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:
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX512
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-DSPEC_OPENMP -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/ -lqkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
**SPEC CPU®2017 Integer Speed Result**

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

| SPECspeed®2017_int_base = 11.9 |
| SPECspeed®2017_int_peak = 12.1 |

| CPU2017 License: 3 | Test Date: Jul-2021 |
| Test Sponsor: HPE | Hardware Availability: Jun-2021 |
| Tested by: HPE | Software Availability: Dec-2020 |

**Peak Compiler Invocation**

C benchmarks (except as noted below):
- icx

600.perlbench_s: icc

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

**Peak Portability Flags**

Same as Base Portability Flags

**Peak Optimization Flags**

C benchmarks:

600.perlbench_s: -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/usr/local/jemalloc64-5.0.1/lib -ljemalloc

602.gcc_s: -m64 -std=c11 -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/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs
-xCORE-AVX512 -flto -O3 -ffast-math
-qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s: basepeak = yes

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Platinum 8352V)

SPECspeed®2017_int_base = 11.9
SPECspeed®2017_int_peak = 12.1

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

Peak Optimization Flags (Continued)

C++ benchmarks:
620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes

Fortran benchmarks:
648.exchange2_s: 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-revE.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-revE.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.8 on 2021-07-17 05:13:32-0400.
Report generated on 2021-08-19 10:50:55 by CPU2017 PDF formatter v6442.
Originally published on 2021-08-17.