Hewlett Packard Enterprise
ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2246G)

CPU2017 License: 3  Test Date:  Oct-2019
Test Sponsor:  HPE  Hardware Availability:  Nov-2019
Tested by:  HPE  Software Availability:  May-2019

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (32.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 6</td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s 6</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 6</td>
<td>16.0</td>
</tr>
<tr>
<td>621.wrf_s 6</td>
<td>39.8</td>
</tr>
<tr>
<td>627.cam4_s 6</td>
<td>26.0</td>
</tr>
<tr>
<td>628.pop2_s 6</td>
<td>36.5</td>
</tr>
<tr>
<td>638.imagick_s 6</td>
<td>30.0</td>
</tr>
<tr>
<td>644.nab_s 6</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 6</td>
<td>58.1</td>
</tr>
<tr>
<td>654.roms_s 6</td>
<td>16.5</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon E-2246G  OS: SUSE Linux Enterprise Server 15 (x86_64)
Max MHz: 4800  Kernel 4.12.14-23-default
Nominal: 3600  Compiler: C/C++: Version 19.0.4.227 of Intel C/C++
Enabled: 6 cores, 1 chip  Compiler Build 20190416 for Linux;
Orderable: 1 chip  Fortran: Version 19.0.4.227 of Intel Fortran
Cache L1: 32 KB I + 32 KB D on chip per core  Compiler Build 20190416 for Linux;
L2: 256 KB I+D on chip per core  Parallel: Yes
L3: 12 MB I+D on chip per chip  Firmware: HPE BIOS Version U44 09/05/2019 released Nov-2019
Other: None  File System: xfs
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-U)  System State: Run level 3 (multi-user)
Storage: 1 x 400 GB SAS SSD, RAID 0  Base Pointers: 64-bit
Other: None  Peak Pointers: Not Applicable
Power Management: --
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2246G)

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Threads</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
</tr>
<tr>
<td>603.bwaves_s</td>
<td>6</td>
<td>756</td>
<td>78.0</td>
<td>756</td>
<td>78.1</td>
<td>758</td>
<td>77.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>6</td>
<td>316</td>
<td>52.8</td>
<td>316</td>
<td>52.8</td>
<td>317</td>
<td>52.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>6</td>
<td>328</td>
<td>16.0</td>
<td>328</td>
<td>16.0</td>
<td>327</td>
<td>16.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>6</td>
<td>333</td>
<td>39.8</td>
<td>334</td>
<td>39.6</td>
<td>331</td>
<td>39.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>6</td>
<td>341</td>
<td>26.0</td>
<td>342</td>
<td>25.9</td>
<td>341</td>
<td>26.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>6</td>
<td>326</td>
<td>36.4</td>
<td>326</td>
<td>36.5</td>
<td>326</td>
<td>36.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>6</td>
<td>483</td>
<td>29.8</td>
<td>482</td>
<td>30.0</td>
<td>481</td>
<td>30.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>6</td>
<td>301</td>
<td>58.0</td>
<td>301</td>
<td>58.1</td>
<td>301</td>
<td>58.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>6</td>
<td>534</td>
<td>17.1</td>
<td>534</td>
<td>17.1</td>
<td>534</td>
<td>17.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>6</td>
<td>955</td>
<td>16.5</td>
<td>954</td>
<td>16.5</td>
<td>957</td>
<td>16.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 32.2
SPECspeed®2017_fp_peak = Not Run

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,compact"
    LD_LIBRARY_PATH = "/home/cpu2017_u4/lib/intel64"
    OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
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.
SPEC CPU®2017 Floating Point Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2246G)

SPECspeed®2017_fp_base = 32.2
SPECspeed®2017_fp_peak = Not Run

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

Test Date: Oct-2019
Hardware Availability: Nov-2019
Software Availability: May-2019

Platform Notes

BIOS Configuration:
Hyper-Threading set to Disabled
Thermal Configuration set to Maximum Cooling
LLC Prefetch set to Enabled
Workload Profile set to General Peak Frequency Compute

Sysinfo program /home/cpu2017_u4/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbl6e6a485a0011
running on ml30-sles15 Fri Oct 18 14:31:22 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-2246G CPU @ 3.60GHz
  1 "physical id"s (chips)
  6 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 6
On-line CPU(s) list: 0-5
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2246G CPU @ 3.60GHz
Stepping: 10
CPU MHz: 3600.000
BogoMIPS: 7200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-5

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2246G)

SPECspeed®2017_fp_base = 32.2
SPECspeed®2017_fp_peak = Not Run

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

Test Date: Oct-2019
Hardware Availability: Nov-2019
Software Availability: May-2019

Platform Notes (Continued)

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 fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcron tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single pti tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ets erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsaveas ibpb ibrs stibp dtherm ida arat pln pts ssbd

/proc/cpuinfo cache data
cache size: 12288 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
node 0 size: 64265 MB
node 0 free: 63778 MB
node distances:
node 0
0: 10

From /proc/meminfo
MemTotal: 65808100 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 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

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

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2246G)

SPECSpeed®2017_fp_base = 32.2
SPECSpeed®2017_fp_peak = Not Run

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

Platform Notes (Continued)

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 18 14:29
SPEC is set to: /home/cpu2017_u4
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 344G 74G 271G 22% /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

==============================================================================
C               | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
------------------------------------------------------------------------------
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.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416

(Continued on next page)
Hewlett Packard Enterprise

ProLiant ML30 Gen10
(3.60 GHz, Intel Xeon E-2246G)

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

SPECSpeed®2017_fp_base = 32.2
SPECSpeed®2017_fp_peak = Not Run

Test Date: Oct-2019
Hardware Availability: Nov-2019
Software Availability: May-2019

Compiler Version Notes (Continued)

Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Intel(R) Fortran 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.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

603.bwaves_s: ~SPEC_LP64
607.cactuBSSN_s: ~SPEC_LP64
Base Portability Flags (Continued)

619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
   -assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
   -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs

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

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
### SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant ML30 Gen10  
(3.60 GHz, Intel Xeon E-2246G)  

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 32.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak = Not Run</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date: Oct-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: Nov-2019</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: May-2019</td>
</tr>
</tbody>
</table>

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 v1.1.0 on 2019-10-18 05:01:22-0400.  
Originally published on 2019-11-12.