SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

SPECrate®2017_fp_base = 208
SPECrate®2017_fp_peak = Not Run

CPU2017 License: 3
Test Sponsor: HPE
Test Date: Jul-2019
Hardware Availability: Jun-2019
CPU2017 License: 3
Tested by: HPE
Software Availability: Feb-2019

<table>
<thead>
<tr>
<th>Software</th>
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<th>Hardware</th>
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<tbody>
<tr>
<td>OS:</td>
<td>SUSE Linux Enterprise Server 15 (x86_64)</td>
<td>CPU Name: Intel Xeon Gold 6262V</td>
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<tr>
<td>Compiler:</td>
<td>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</td>
<td>Max MHz: 3600</td>
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<td>HPE BIOS Version U32 05/21/2019 released Jun-2019</td>
<td>Nominal: 1900</td>
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<td>File System:</td>
<td>xfs</td>
<td>Enabled: 48 cores, 2 chips, 2 threads/core</td>
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<tr>
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<td>Run level 3 (multi-user)</td>
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<tr>
<td>Base Pointers:</td>
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<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
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<td>Peak Pointers:</td>
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<td>L2: 1 MB I+D on chip per core</td>
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<tr>
<td>Other:</td>
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<td>L3: 33 MB I+D on chip per chip</td>
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<td>Power Management:</td>
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<th>507.cactuBSSN_r</th>
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<th>510.parest_r</th>
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<th>527.cam4_r</th>
<th>538.imagick_r</th>
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Software Availability: Feb-2019

Test Sponsor: HPE

Hardware Availability: Jun-2019

Tested by: HPE

Test Date: Jul-2019

**SPECrate®2017_fp_base** = 208

**SPECrate®2017_fp_peak** = Not Run

CPU Name: Intel Xeon Gold 6262V
Max MHz: 3600
Nominal: 1900
Enabled: 48 cores, 2 chips, 2 threads/core
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 33 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2400)
Storage: 1 x 400 GB SAS SSD, RAID 0
Other: None
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

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

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SPECrate®2017_fp_base = 208
SPECrate®2017_fp_peak = Not Run

Results 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
runcpu command invoked through numactl i.e.:
    numactl --interleave=all runcpu <etc>

General Notes
Environment variables set by runcpu before the start of the run:
    LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory 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.

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

General Notes (Continued)

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
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 Throughput Compute
Workload Profile set to Custom
Energy/Performance Bias set to Balanced Performance
Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd08f2999c33d61f64985e45859ea9
running on linux-nub3 Fri Jul 12 23:36:27 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) Gold 6262V CPU @ 1.90GHz
 2 "physical id"s (chips)
 96 "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 : 24
  siblings : 48
  physical 0: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
  physical 1: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

SPECrate®2017_fp_base = 208
SPECrate®2017_fp_peak = Not Run

Platform Notes (Continued)

CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6262V CPU @ 1.90GHz
Stepping: 7
CPU MHz: 1900.000
BogoMIPS: 3800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 33792K
NUMA node0 CPU(s): 0-11,48-59
NUMA node1 CPU(s): 12-23,60-71
NUMA node2 CPU(s): 24-35,72-83
NUMA node3 CPU(s): 36-47,84-95
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 rdtsscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sbdb fma cx16 xtrr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

(Continued on next page)
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</table>

**SPECrate®2017_fp_base = 208**

**SPECrate®2017_fp_peak = Not Run**

Platform Notes (Continued)

0: 10 21 31 31  
1: 21 10 31 31  
2: 31 31 10 21  
3: 31 31 21 10  

From /proc/meminfo  
MemTotal: 395888136 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 linux-nub3 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_FW  

run-level 3 Jul 12 23:34  

SPEC is set to: /home/cpu2017_u2  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda1 xfs 373G 135G 239G 37% /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 U32 05/21/2019  
Memory:  
24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 2400  

(End of data from sysinfo program)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

SPECreate®2017_fp_base = 208
SPECreate®2017_fp_peak = Not Run

CPU2017 License: 3
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Hardware Availability: Jun-2019
Software Availability: Feb-2019

Compiler Version Notes

==============================================================================
| C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base) |
---|--------------------------------------------------|
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.  
==============================================================================

==============================================================================
| C++              | 508.namd_r(base) 510.parest_r(base) |
---|----------------------------------|
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.  
==============================================================================

==============================================================================
| C++, C             | 511.povray_r(base) 526.blender_r(base) |
---|------------------------------------|
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.  
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.  
Intel(R) Fortran 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.  
==============================================================================

==============================================================================
| C++, C, Fortran     | 507.cactuBSSN_r(base) |
---|---------------------|
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.  
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.  
Intel(R) Fortran 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.  
==============================================================================

==============================================================================
| Fortran           | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base) |
---|-------------------|
Intel(R) Fortran 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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### Compiler Version Notes (Continued)

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Fortran, C | 521.wrf_r(base) 527.cam4_r(base)

---

Intel (R) Fortran 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.
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.
---

### Base Compiler Invocation

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

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

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

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

Benchmarks using both C and C++:
```
icpc -m64 icc -m64 -std=c11
```

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

### Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactusBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char

(Continued on next page)
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Base Portability Flags (Continued)

527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

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
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-03.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 CPU®2017 v1.0.5 on 2019-07-12 14:06:26-0400.  
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