Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.40 GHz, Intel Xeon Gold 6148)

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

TEST DATE: Nov-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

Hardware
CPU Name: Intel Xeon Gold 6148
Max MHz.: 3700
Nominal: 2400
Enabled: 40 cores, 2 chips
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: 27.5 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 960 GB SATA SSD, RAID 0
Other: None

Software
OS: SUSE Linux Enterprise Server 12 (x86_64) SP2
Kernel 4.4.21-69-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Compiler for Linux;
Fortran: Version 18.0.0.128 of Intel Fortran
Compiler for Linux
Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None

SPECspeed2017_fp_base = 114
SPECspeed2017_fp_peak = Not Run

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>480</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>474</td>
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<tr>
<td>619.libm_s</td>
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<td>621.wrf_s</td>
<td>847</td>
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<td>627.cam4_s</td>
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<td>628.pop2_s</td>
<td>650</td>
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<tr>
<td>638.imagick_s</td>
<td>113</td>
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<tr>
<td>644.nab_s</td>
<td>213</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>654.roms_s</td>
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SPECspeed2017_fp_base (114)
SPEC CPU2017 Floating Point Speed Result

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Results Table

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<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Threads</th>
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<th>Ratio</th>
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SPECspeed2017_fp_base = 114
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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
Filesystem page cache cleared with:
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
irqbalance disabled with "systemctl stop irqbalance"
tuned profile set with 'tuned-adm profile throughput-performance'

General Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=core,compact"
LD_LIBRARY_PATH = "'/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32''"  
LD_LIBRARY_PATH = "'$LD_LIBRARY_PATH:/home/cpu2017/je5.0.1-64'"  
OMP_STACKSIZE = "'192M'"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4

Platform Notes
BIOS Configuration:
Intel Hyperthreading set to Disabled
Thermal Configuration set to Maximum Cooling
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Memory Patrol Scrubbing set to Disabled
Workload Profile set to General Peak Frequency Compute
## Platform Notes (Continued)

Energy/Performance Bias set to Maximum Performance  
Workload Profile set to Custom  
NUMA Group Size Optimization set to Flat  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
runtime on linux-0f29 Tue Nov 7 15:26:08 2017

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 6148 CPU @ 2.40GHz  
- 2 "physical id"s (chips)  
- 40 "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 : 20  
  - siblings : 20  
  - physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28  
  - physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:

- Architecture: x86_64  
- CPU op-mode(s): 32-bit, 64-bit  
- Byte Order: Little Endian  
- CPU(s): 40  
- On-line CPU(s) list: 0-39  
- Thread(s) per core: 1  
- Core(s) per socket: 20  
- Socket(s): 2  
- NUMA node(s): 2  
- Vendor ID: GenuineIntel  
- CPU family: 6  
- Model: 85  
- Model name: Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz  
- Stepping: 4  
- CPU MHz: 2394.383  
- BogoMIPS: 4788.76  
- Virtualization: VT-x  
- L1d cache: 32K  
- L1i cache: 32K  
- L2 cache: 1024K  
- L3 cache: 28160K  
- NUMA node0 CPU(s): 0-19  
- NUMA node1 CPU(s): 20-39  
- Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)
**SPEC CPU2017 Floating Point Speed Result**

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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Nov-2017  
**Hardware Availability:** Oct-2017  
**Software Availability:** Sep-2017

**Platform Notes (Continued)**

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  
aperfmerf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg  
fxma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes  
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm intel_pt  
tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  
erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd  
avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_1llc cqm_occop_1llc

```
/proc/cpuinfo cache data  
cache size : 28160 KB
```

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  
node 0 size: 193116 MB  
node 0 free: 189592 MB  
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39  
node 1 size: 193532 MB  
node 1 free: 192214 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10

From /proc/meminfo  
MemTotal: 395927716 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

```
/usr/bin/lsb_release -d  
SUSE Linux Enterprise Server 12 SP2
```

From /etc/*release* /etc/*version*  
SuSE-release:  
SUSE Linux Enterprise Server 12 (x86_64)  
VERSION = 12  
PATCHLEVEL = 2  
# This file is deprecated and will be removed in a future service pack or release.  
# Please check /etc/os-release for details about this release.  
os-release:  
NAME="SLES"  
VERSION="12-SP2"  
VERSION_ID="12.2"  
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"  
ID="sles"

(Continued on next page)
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SPECspeed2017_fp_base = 114  
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Platform Notes (Continued)  

ANSI_COLOR="0;32"  
CPE_NAME="cpe:/o:suse:sles:12:sp2"  

uname -a:  
Linux linux-0f29 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)  
x86_64 x86_64 x86_64 GNU/Linux  
run-level 3 Nov 7 12:51  
SPEC is set to: /home/cpu2017  
Filesystem  Type Size Used Avail Use% Mounted on  
/dev/sda4      xfs   852G   19G  833G   3% /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 I42 08/19/2017  
Memory:  
24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666  

(End of data from sysinfo program)  

Compiler Version Notes  

==============================================================================  
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)  
==============================================================================  
icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
==============================================================================  
FC  607.cactuBSSN_s(base)  
==============================================================================  
icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
==============================================================================  
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)  
==============================================================================  
(Continued on next page)
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**Compiler Version Notes (Continued)**

```plaintext
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
==============================================================
CC 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
```

```plaintext
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

### Base Compiler Invocation

<table>
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<tr>
<th>C benchmarks:</th>
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<tbody>
<tr>
<td>icc</td>
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<table>
<thead>
<tr>
<th>Fortran benchmarks:</th>
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<tr>
<td>ifort</td>
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<table>
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<tr>
<th>Benchmarks using both Fortran and C:</th>
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<tr>
<td>ifort icc</td>
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<thead>
<tr>
<th>Benchmarks using Fortran, C, and C++:</th>
</tr>
</thead>
<tbody>
<tr>
<td>icpc icc ifort</td>
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</tbody>
</table>

**Base Portability Flags**

603.bwaves_s: -DSPEC_LP64  
607.cactusBSSN_s: -DSPEC_LP64  
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
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Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-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=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

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

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

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-SKX-revF.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-SKX-revF.xml
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<tr>
<th>Attribute</th>
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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 v1.0.2 on 2017-11-07 16:26:08-0500.  
Originally published on 2017-11-29.