![SPEC® CPU2017 Floating Point Speed Result](https://www.spec.org/)

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant BL460c Gen10  
(2.60 GHz, Intel Xeon Gold 6142)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base = 109</th>
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<tr>
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Dec-2017  
**Hardware Availability:** Nov-2017  
**Software Availability:** Sep-2017

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (109)</th>
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<tr>
<td>603.bwaves_s 32</td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s 32</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 32</td>
<td></td>
</tr>
<tr>
<td>621.wrf_s 32</td>
<td></td>
</tr>
<tr>
<td>627.cam4_s 32</td>
<td></td>
</tr>
<tr>
<td>628.pop2_s 32</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 32</td>
<td></td>
</tr>
<tr>
<td>644.nab_s 32</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 32</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 32</td>
<td></td>
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</table>

**Hardware**

CPU Name: Intel Xeon Gold 6142  
Max MHz.: 3700  
Nominal: 2600  
Enabled: 32 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: 22 MB I+D on chip per chip  
Other: None  
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)  
Storage: 2 x 480 GB SATA SSD, RAID 0  
Other: None

**Software**

OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)  
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  
Firmware: HPE BIOS Version I41 released Oct-2017 (tested with I41 11/14/2017)  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: Not Applicable  
Other: None
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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>
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<tbody>
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<td>81.1</td>
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<tr>
<td>628.pop2_s</td>
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<td>67.1</td>
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<td>66.8</td>
<td>177</td>
<td>67.2</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
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<td>186</td>
<td>94.0</td>
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<td>649.fotonik3d_s</td>
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<td>654.roms_s</td>
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<td>134</td>
<td>117</td>
<td>135</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 109
SPECspeed2017_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
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:/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
    Energy/Performance Bias set to Maximum Performance

(Continued on next page)
Platform Notes (Continued)

Workload Profile set to Custom
NUMA Group Size Optimization set to Flat
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bce091c0f
running on bl460c16 Tue Dec 5 03:15:15 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 6142 CPU @ 2.60GHz
  2 "physical id"s (chips)
  32 "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

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2600.000
BogoMIPS: 5200.00
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
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 rdtscp

(Continued on next page)
Platform Notes (Continued)

lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmrperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_13 intel_pt
tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
ermi invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb
avx512cd avx512bw avx512vl xsaveopt xsavevc xsave xgetbv1 cqm_llc cqm_occup_llc
cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts

/proc/cpuinfo cache data
cache size : 22528 KB

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

From /proc/meminfo
MemTotal: 197749752 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
Linux bl460c16 3.10.0-693.el7.x86_64 #1 SMP Thu Jul 6 19:56:57 EDT 2017 x86_64 x86_64
x86_64 GNU/Linux

run-level 3 Dec 5 00:34

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 839G 31G 808G 4% /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

(Continued on next page)
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
   BIOS HPE I41 11/14/2017
   Memory:
       4x UNKNOWN NOT AVAILABLE
       12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 192 GB and the dmidecode description should have one line reading as:
       12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666 MHz

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)
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Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_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

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

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**Base Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++:
- `xCORE-AVX2`  
- `ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only`  
- `qopt-mem-layout-trans=3 -gopenmp -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`

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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-revH.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-revH.xml

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

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