# SPEC CPU®2017 Floating Point Rate Result

## Altos Computing Inc.
### BrainSphere R389 F4 (Intel Xeon Gold 6248R)

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Feb-2021</th>
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<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Feb-2020</td>
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<td>Software Availability:</td>
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### SPECrate®2017_fp_base = 283

### SPECrate®2017_fp_peak = 301

<table>
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<tr>
<th>Test Sponsor:</th>
<th>Altos Computing Inc.</th>
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<tbody>
<tr>
<td>Tested by:</td>
<td>Altos Computing Inc.</td>
</tr>
</tbody>
</table>

### CPU2017 License: 97

### CPU Name: Intel Xeon Gold 6248R
- **Max MHz:** 4000
- **Nominal:** 3000
- **Enabled:** 48 cores, 2 chips, 2 threads/core
- **Orderable:** 1,2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 35.75 MB I+D on chip per chip
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R)
- **Storage:** 1 x 1.6 TB SATA SSD
- **Other:** None

### Software
- **OS:** Red Hat Enterprise Linux release 8.1 (Ootpa) 4.18.0-147.el8.x86_64
- **Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler Build 20200306 for Linux;
  Fortran: Version 19.1.1.217 of Intel Fortran Compiler Build 20200306 for Linux
- **Parallel:** No
- **Firmware:** Version R12 released Jul-2020
- **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

### Hardware
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R)
- **Storage:** 1 x 1.6 TB SATA SSD
- **Other:** None

### SPEC CPU 2017 Floating Point Rate Result

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**Note:** The images and tables in the document have been rendered in a readable format. For a more detailed analysis, please refer to the report and specifications provided by SPEC.
Altos Computing Inc.

BrainSphere R389 F4 (Intel Xeon Gold 6248R)

SPECrate®2017_fp_base = 283

SPECrate®2017_fp_peak = 301

Results Table

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</table>

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Versio 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64://home/cpu2017/je5.0.1-64"
MALLOCONF_CONF = "retain:true"
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**BrainSphere R389 F4 (Intel Xeon Gold 6248R)**

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<thead>
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<th>SPECrate®2017_fp_peak = 301</th>
<th>SPECrate®2017_fp_base = 283</th>
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</table>

**General Notes**

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0

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>
```

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.


**Platform Notes**

**BIOS Configuration:**
Power Policy Quick Settings set to Best Performance
IMC set to 1-way interleaving
Sub_NUMA Cluster set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011 running on rhel81 Tue Feb 23 01:29:47 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) Gold 6248R CPU @ 3.00GHz
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 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
```

From lscpu:
```
Architecture: x86_64
```

(Continued on next page)
Altos Computing Inc.

BrainSphere R389 F4 (Intel Xeon Gold 6248R)

**SPEC CPU®2017 Floating Point Rate Result**

**SPECrate®2017_fp_base = 283**

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<td>Apr-2020</td>
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### Platform Notes (Continued)

```
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
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6248R CPU @ 3.00GHz
Stepping: 7
CPU MHz: 3694.786
CPU max MHz: 4000.0000
CPU min MHz: 1200.0000
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3, 7, 8-12, 14-18, 20-24, 48-51, 55, 56-60, 62-66, 68-71
NUMA node1 CPU(s): 4-6, 9-11, 15-17, 21-23, 52-54, 57-59, 63-65, 69-71
NUMA node2 CPU(s): 24-27, 31-33, 37-39, 43, 44, 72-75, 79-81, 85-87, 91, 92
NUMA node3 CPU(s): 28-30, 34-36, 40-42, 45-47, 76-78, 82-84, 88, 90, 93-95
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 rdtsscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperf perf accept pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 l sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abmlahf_lm abm 3nowprefetch cpuid_fault ebpf cat l3 cdp l3
invpcid_single intel_pcin l ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 efs invpcid rtm cmqm mxn mxp rdt_a avx512f avx512d avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsecp xgetbv1 xsaves cqm_lcccc cqm_occup_lccc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts hw_act_window hwlp_epp hwlp_pkg_req pku ospk axv512_vnni md_clear flush_lld arch_capabilities
```

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

available: 4 nodes (0-3)

node 0 cpus: 0 1 2 3 7 8 12 13 14 18 19 20 48 49 50 51 55 56 60 61 62 66 67 68
node 0 size: 191849 MB

(Continued on next page)
**Altos Computing Inc.**

**CPU2017 License:** 97  
**Test Sponsor:** Altos Computing Inc.  
**Tested by:** Altos Computing Inc.  

### Platform Notes (Continued)

- **node 0 free:** 178330 MB  
- **node 1 cpus:** 4 5 6 9 10 11 15 16 17 21 22 23 52 53 54 57 58 59 63 64 65 69 70 71  
- **node 1 size:** 193531 MB  
- **node 1 free:** 184020 MB  
- **node 2 cpus:** 24 25 26 27 31 32 33 37 38 39 43 44 72 73 74 75 79 80 81 85 86 87 91 92  
- **node 2 size:** 193505 MB  
- **node 2 free:** 183718 MB  
- **node 3 cpus:** 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 89 90 93 94 95  
- **node 3 size:** 193530 MB  
- **node 3 free:** 183937 MB  
- **node distances:**
  - **node 0:** 10 11 21 21  
  - **node 1:** 11 10 21 21  
  - **node 2:** 21 21 10 11  
  - **node 3:** 21 21 11 10  

From `/proc/meminfo`

- **MemTotal:** 790955200 kB  
- **HugePages_Total:** 0  
- **Hugepagesize:** 2048 kB

From `/etc/*release* /etc/*version*`

- **os-release:**
  - **NAME:** "Red Hat Enterprise Linux"  
  - **VERSION:** "8.1 (Ootpa)"  
  - **ID:** "rhel"  
  - **ID_LIKE:** "fedora"  
  - **VERSION_ID:** "8.1"  
  - **PLATFORM_ID:** "platform:el8"  
  - **PRETTY_NAME:** "Red Hat Enterprise Linux 8.1 (Ootpa)"  
  - **ANSI_COLOR:** "0;31"  

- **redhat-release:** Red Hat Enterprise Linux release 8.1 (Ootpa)  
- **system-release:** Red Hat Enterprise Linux release 8.1 (Ootpa)  
- **system-release-cpe:** cpe:/o:redhat:enterprise_linux:8.1:ga

- **uname -a:**
  - Linux rhel81 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019 x86_64 x86_64 GNU/Linux

**Kernel self-reported vulnerability status:**

- **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)
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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

run-level 3 Feb 22 17:47
SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 1.5T 176G 1.3T 13% /home

From /sys/devices/virtual/dmi/id
BIOS: GIGABYTE R12 07/21/2020
Vendor: Altos
Product: BrainSphere R389 F4
Product Family: Server
Serial: GIBRN8521A0019

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: 24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak) |
------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
| C++             | 508.namd_r(base, peak) 510.parest_r(base, peak) |
------------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================

(Continued on next page)
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**BrainSphere R389 F4 (Intel Xeon Gold 6248R)**

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**CPU2017 License:** 97  
**Test Sponsor:** Altos Computing Inc.  
**Tested by:** Altos Computing Inc.

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**Compiler Version Notes (Continued)**

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| C++, C | 511.povray\_r(base) 526.blender\_r(base, peak) |
|-----------------------------------------------|
| Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1 |
| NextGen Build 20200304 |
| Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
| Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1 |
| NextGen Build 20200304 |
| Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

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| C++, C | 511.povray\_r(peak) |
|-----------------------------------------------|
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.1.1.217 Build 20200306 |
| Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.1.1.217 Build 20200306 |
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| C++, C | 511.povray\_r(base) 526.blender\_r(base, peak) |
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| NextGen Build 20200304 |
| Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

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| C++, C | 511.povray\_r(peak) |
|-----------------------------------------------|
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.1.1.217 Build 20200306 |
| Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.1.1.217 Build 20200306 |
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---

| C++, C, Fortran | 507.cactuBSSN\_r(base, peak) |
|-----------------------------------------------|

(Continued on next page)
Altos Computing Inc.
BrainSphere R389 F4 (Intel Xeon Gold 6248R)

SPECRate®2017_fp_base = 283
SPECRate®2017_fp_peak = 301

CPU2017 License: 97
Test Sponsor: Altos Computing Inc.
Test Date: Feb-2021
Tested by: Altos Computing Inc.
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Compiler Version Notes (Continued)

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
   NextGen Build 20200304
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
   NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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------------------------------------------------------------------------------
==============================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                  | 554.roms_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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------------------------------------------------------------------------------
==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
   NextGen Build 20200304
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------------------------------------------------------------------------------
==============================================================================
Fortran, C      | 521.wrf_r(peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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------------------------------------------------------------------------------
==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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(Continued on next page)
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Intel (R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64

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

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
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:
-m64 -gnextgen -std=c11
-Wl,-plugin-opt=-x86-braches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -gnextgen -Wl,-plugin-opt=-x86-braches-within-32B-boundaries
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-braches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:
-m64 -gnextgen -std=c11
-Wl,-plugin-opt=-x86-braches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

(Continued on next page)
Altos Computing Inc.

BrainSphere R389 F4 (Intel Xeon Gold 6248R)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPEC®2017_fp_base = 283

SPEC®2017_fp_peak = 301

Base Optimization Flags (Continued)

Benchmarks using both C and C++:
- m64
- qnextgen
- std=c11
- Wl,-plugin-opt=-x86-branches-within-32B-boundaries
- Wl,-z,muldefs
- fuse-ld=gold
- xCORE-AVX512
- Ofast
- ffast-math
- flto
- mfpmath=sse
- funroll-loops
- qopt-mem-layout-trans=4
- L/usr/local/jemalloc64-5.0.1/lib
- ljemalloc

Benchmarks using Fortran, C, and C++:
- m64
- qnextgen
- std=c11
- Wl,-plugin-opt=-x86-branches-within-32B-boundaries
- Wl,-z,muldefs
- fuse-ld=gold
- xCORE-AVX512
- Ofast
- ffast-math
- flto
- mfpmath=sse
- funroll-loops
- qopt-mem-layout-trans=4
- O3
- ipo
- no-prec-div
- qopt-prefetch
- ffinite-math-only
- qopt-multiple-gather-scatter-by-shuffles
- nostandard-realloc-lhs
- align array32byte
- auto
- mbranches-within-32B-boundaries
- L/usr/local/jemalloc64-5.0.1/lib
- ljemalloc

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

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

Peak Portability Flags

Same as Base Portability Flags
Altos Computing Inc.  
BrainSphere R389 F4 (Intel Xeon Gold 6248R)  

**SPEC CPU®2017 Floating Point Rate Result**

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>283</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>301</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 97  
**Test Sponsor:** Altos Computing Inc.  
**Test Date:** Feb-2021  
**Tested by:** Altos Computing Inc.  
**Hardware Availability:** Feb-2020  
**Software Availability:** Apr-2020

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**Peak Optimization Flags**

### C benchmarks:

- 519提炼_r: basepeak = yes
- 538.imagick_r: basepeak = yes
- 544.nab_r: basepeak = yes

### C++ benchmarks:

- 508.namd_r: basepeak = yes

```bash
510.parest_r -m64 -qnextgen
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast
-ffast-math -flto -m64 -mbranches-within-32B-boundaries
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc
```

### Fortran benchmarks:

- 503.bwaves_r -m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
- -Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -O3 -ipo
- -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-multiple-gather-scatter-by-shuffles
- -qopt-mem-layout-trans=4 -nostandard-realloc-lhs
- -align array32byte -auto -mbranches-within-32B-boundaries
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 549.fotonik3d_r: basepeak = yes

- 554.roms_r: Same as 503.bwaves_r

### Benchmarks using both Fortran and C:

- 521.wrf_r -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
- -ipo -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-multiple-gather-scatter-by-shuffles
- -qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
- -nostandard-realloc-lhs -align array32byte -auto
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 527.cam4_r: basepeak = yes

### Benchmarks using both C and C++:

(Continued on next page)
Altos Computing Inc.
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SPECrate®2017_fp_base = 283
SPECrate®2017_fp_peak = 301

Peak Optimization Flags (Continued)

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Altos-Platform-Settings-V1.0-revD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Altos-Platform-Settings-V1.0-revD.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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