### Dell Inc. PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Dell Inc.</th>
<th>Test Date:</th>
<th>May-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Hardware Availability:</td>
<td>Jul-2021</td>
</tr>
<tr>
<td>SPECrate®2017_fp_base</td>
<td>120</td>
<td>Software Availability:</td>
<td>Feb-2021</td>
</tr>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>123</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 5317</th>
<th>Max MHz:</th>
<th>3600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal:</td>
<td>3000</td>
<td>Enabled:</td>
<td>12 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1 chip</td>
<td>L1:</td>
<td>32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>Cache L1:</td>
<td></td>
<td>L2:</td>
<td>1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L3:</td>
<td>18 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
<td>Memory:</td>
<td>512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R, running at 2933)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 240 GB M.2 SATA SSD</td>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

#### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>Red Hat Enterprise Linux 8.3 (Ootpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux</td>
</tr>
<tr>
<td>Firmware:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 5 (graphical multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other:</td>
<td>jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Power Management:</td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage.</td>
</tr>
</tbody>
</table>

#### SPEC CPU 2017 Floating Point Rate Result

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
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</thead>
<tbody>
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<td>24</td>
<td>151</td>
<td>173</td>
</tr>
<tr>
<td>24</td>
<td>76.3</td>
<td>104</td>
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<td>24</td>
<td>67.1</td>
<td>110</td>
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<td>24</td>
<td>115</td>
<td>122</td>
</tr>
<tr>
<td>24</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>272</td>
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<tr>
<td>24</td>
<td>93.0</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>56.8</td>
<td></td>
</tr>
</tbody>
</table>

---

**Note:** The above data represents the performance results of the Dell Inc. PowerEdge XR12 system in SPEC CPU 2017 Floating Point Rate benchmark. The system is equipped with an Intel Xeon Gold 5317 processor running at 3.00 GHz, and it was tested by Dell Inc. The test was conducted on May-2021 with software availability in Feb-2021.
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.
PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Results Table

<table>
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<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
<td>503.bwaves_r</td>
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<tr>
<td>507.cactuBSSN_r</td>
<td>24</td>
<td>200</td>
<td>152</td>
<td>201</td>
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<td>151</td>
<td>201</td>
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<tr>
<td>508.namd_r</td>
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<td>671</td>
<td>56.8</td>
<td>671</td>
<td>56.8</td>
</tr>
</tbody>
</table>

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/cpu2017-1.1.5-ic2021.1/lib/intel64:/home/cpu2017-1.1.5-ic2021.1/jre5.0.1-64"
MALLOC_CONF = "retain:true"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1
Transparent Huge Pages enabled by default

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

Dell Inc.
PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

SPECrate®2017_fp_base = 120
SPECrate®2017_fp_peak = 123

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

General Notes (Continued)

Prior to runcpu invocation
Filesystem page cache synced and cleared with:
`sync; echo 3 > /proc/sys/vm/drop_caches`
runcpu command invoked through numacl i.e.:
`numacl --interleave=all runcpu <etc>`
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
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 Settings:
Sub NUMA Cluster : 2-Way Clustering
Virtualization Technology : Disabled

System Profile : Custom
CPU Power Management : Maximum Performance
   C1E : Disabled
   C States : Autonomous
Memory Patrol Scrub : Disabled
Energy Efficiency Policy : Performance
CPU Interconnect Bus Link
   Power Management : Disabled

Sysinfo program /home/cpu2017-1.1.5-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c running on localhost.localdomain Fri May 14 16:24:15 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 5317 CPU @ 3.00GHz
   1 "physical id"s (chips)
   24 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

(Continued on next page)
Dell Inc. PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

SPEC CPU®2017 Floating Point Rate Result

Dell Inc. SPECrate®2017_fp_base = 120

SPECrate®2017_fp_peak = 123

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: May-2021
Hardware Availability: Jul-2021
Software Availability: Feb-2021

---

**Platform Notes (Continued)**

```
cpu cores : 12
siblings : 24
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11
```

From lscpu:
```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 1
NUMA node(s): 2
```

Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 5317 CPU @ 3.00GHz
Stepping: 6
CPU MHz: 3374.884
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 18432K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23

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 rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg 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 cpuid_fault epb cat_l3 invpcid_single intel_pimp ssbd mbx ibpb stibp ibrs Enhanced fsqgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cmq qr tdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_hni avx512bw avx512lv xsaveopt xsavec xgetbv1 xsaveas cmq_llc cmq_mbb_total cmq_mbb_local split_lock_detect wbinvd dtherm ida pslat pll pslat12v 1bmi umip pku ospe avx512_vbmi 2 gfni vaes vpcm1udq avx512_vnni avx512_vbmi tmc avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d

/platform/cpuinfo cache data
```
cache size : 18432 KB
```

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

(Continued on next page)
Dell Inc.

PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 120
SPECrate®2017_fp_peak = 123

Dell Inc.

PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

SPECrate®2017_fp_base = 120
SPECrate®2017_fp_peak = 123

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: May-2021
Hardware Availability: Jul-2021
Software Availability: Feb-2021

Platform Notes (Continued)

available: 2 nodes (0-1)
node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22
node 0 size: 253397 MB
node 0 free: 241624 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23
node 1 size: 253634 MB
node 1 free: 256566 MB
node distances:
node 0 1
0: 10 11
1: 11 10

From /proc/meminfo
MemTotal: 527816908 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: throughput-performance

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

os-release:
  NAME="Red Hat Enterprise Linux"
  VERSION="8.3 (Ootpa)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="8.3"
  PLATFORM_ID="platform:el8"
  PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
  ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
Linux localhost.localdomain 4.18.0-240.15.1.el8_3.x86_64 #1 SMP Wed Feb 3 03:12:15 EST 2021 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):
CVE-2018-3620 (L1 Terminal Fault):
Microarchitectural Data Sampling:
CVE-2017-5754 (Meltdown):
CVE-2018-3639 (Speculative Store Bypass):

Not affected
Not affected
Not affected
Not affected
Mitigation: Speculative Store Bypass disabled via prctl and seccomp

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

Dell Inc.  
PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 120</th>
<th>SPECrate®2017_fp_peak = 123</th>
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</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** May-2021  
**Hardware Availability:** Jul-2021  
**Software Availability:** Feb-2021

---

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>CVE-2017-5753 (Spectre variant 1):</th>
<th>Mitigation: usercopy/swapgs barriers and __user pointer sanitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE-2017-5715 (Spectre variant 2):</td>
<td>Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling</td>
</tr>
<tr>
<td>CVE-2020-0543 (Special Register Buffer Data Sampling):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2019-11135 (TSX Asynchronous Abort):</td>
<td>Not affected</td>
</tr>
</tbody>
</table>

run-level 5 May 14 11:53

SPEC is set to: /home/cpu2017-1.1.5-ic2021.1

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel-home</td>
<td>xfs</td>
<td>168G</td>
<td>8.2G</td>
<td>160G</td>
<td>5%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

- **Vendor:** Dell Inc.  
- **Product:** PowerEdge XR12  
- **Product Family:** PowerEdge  
- **Serial:** 09A000C

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 002C069D002C 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200, configured at 2933  
  - 4x 00AD063200AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200, configured at 2933

- **BIOS:**  
  - **BIOS Vendor:** Dell Inc.  
  - **BIOS Version:** 0.9.0  
  - **BIOS Date:** 05/10/2021  
  - **BIOS Revision:** 0.9

(End of data from sysinfo program)

---

**Compiler Version Notes**

```plaintext
==============================================================================
C  | 519.lbm_r(base, peak) 538.imagick_r(base, peak)  
544.nab_r(base, peak)  
==============================================================================
```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
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(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

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PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)  

SPECrate®2017_fp_base = 120  
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Compiler Version Notes (Continued)

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
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Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| C++, C          | 511.povray_r(peak) |
==============================================================================

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.1 Build 20201112_000000  
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==============================================================================
| C++, C          | 511.povray_r(base) 526.blender_r(base, peak) |
==============================================================================

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
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==============================================================================
| C++, C          | 511.povray_r(peak) |
==============================================================================

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.1 Build 20201112_000000  
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Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64,  
Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| C++, C          | 511.povray_r(base) 526.blender_r(base, peak) |
==============================================================================

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113

(Continued on next page)
## Dell Inc.

### PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

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<th>SPECrate®2017_fp_base</th>
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<th>CPU2017 License: 55</th>
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<td>Software Availability: Feb-2021</td>
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### Compiler Version Notes (Continued)

C++, C, Fortran | 507.cactuBSSN_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
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Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
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### Base Compiler Invocation

C benchmarks:

icx

(Continued on next page)
Base Compiler Invocation (Continued)

C++ benchmarks:
  icpx

Fortran benchmarks:
  ifort

Benchmarks using both Fortran and C:
  ifort icx

Benchmarks using both C and C++:
  icpx icx

Benchmarks using Fortran, C, and C++:
  icpx icx ifort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_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
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:
  -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
  -flto -mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4
  -mbranches-within-32B-boundaries -ljemalloc
  -L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
  -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
  -mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4

(Continued on next page)
Dell Inc.

PowerEdge XR12 (Intel Xeon Gold 5317, 3.00 GHz)

SPECrate®2017_fp_base = 120
SPECrate®2017_fp_peak = 123

C++ benchmarks (continued):
- mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
- w -m64 -Wl,-z,muldefs -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 -ljemalloc
  -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
- w -m64 -std=c11 -Wl,-z,muldefs -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
  -mbranches-within-32B-boundaries -nostandard-realloc-lhs
  -align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

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

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

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Peak Compiler Invocation

(Continued on next page)
Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icx
Benchmarks using both C and C++:
511.povray_r: icpc icc
526.blender_r: icpx icx
Benchmarks using Fortran, C, and C++:
icpx icx ifort

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes
544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -qopt-mem-layout-trans=4
-flto -acc -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -qopt-mem-layout-trans=4
-Wl,-z,muldefs -xCORE-AVX512 -flto -acc -std=c11 -m64
-Wl,-z,muldefs -xCORE-AVX512 -flto -acc -std=c11 -m64
-Wl,-z,muldefs -xCORE-AVX512 -flto -acc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

(Continued on next page)
Peak Optimization Flags (Continued)

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -w -m64 -W1,-z,muldefs -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
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.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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