Dell Inc.

PowerEdge R750xa (Intel Xeon Gold 5317, 3.00 GHz)

SPECspeed®2017_fp_base = 132
SPECspeed®2017_fp_peak = 135

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

Threads

<table>
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<tr>
<th>Thread</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tr>
<td>603.bwaves_s</td>
<td>164</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>126</td>
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<tr>
<td>621.wrf_s</td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>82.5</td>
<td></td>
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<tr>
<td>628.pop2_s</td>
<td>76.8</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
<td>204</td>
<td></td>
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<tr>
<td>649.fotonik3d_s</td>
<td>96.8</td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>127</td>
<td></td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 5317
Max MHz: 3600
Nominal: 3000
Enabled: 24 cores, 2 chips
Orderable: 1.2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 18 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)
Storage: 225 GB on tmpfs
Other: None

Software

OS: Red Hat Enterprise Linux 8.3 (Ootpa) 4.18.0-240.15.1.el8_3.x86_64
Compiler: 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
Parallel: Yes
Firmware: Version 1.2.2 released May-2021
File System: tmpfs
System State: Run level 5 (graphical multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.
SPEC CPU®2017 Floating Point Speed Result

Dell Inc. PowerEdge R750xa (Intel Xeon Gold 5317, 3.00 GHz)

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECspeed®2017_fp_base = 132
SPECspeed®2017_fp_peak = 135

Results Table

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<td>124</td>
<td>127</td>
<td>124</td>
<td>127</td>
<td>124</td>
</tr>
</tbody>
</table>

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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

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

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)
**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.

Benchmark run from a 225 GB ramdisk created with the cmd: "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk"

**Platform Notes**

BIOS Settings:
- Logical Processor : Disabled
- 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 /mnt/ramdisk/cpu2017-1.1.5-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeea89d4b38e2f1c
running on localhost.localdomain Wed May 19 13:25:15 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
- 2 "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.)
- cpu cores : 12
- siblings : 12
- physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11
- physical 1: 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

(Continued on next page)
### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>CPU(s):</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-line CPU(s) list:</td>
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<tr>
<td>Thread(s) per core:</td>
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<tr>
<td>Core(s) per socket:</td>
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<tr>
<td>Socket(s):</td>
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</tr>
<tr>
<td>NUMA node(s):</td>
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<tr>
<td>Vendor ID:</td>
<td>GenuineIntel</td>
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<td>CPU family:</td>
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<td>Model:</td>
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<tr>
<td>Model name:</td>
<td>Intel(R) Xeon(R) Gold 5317 CPU @ 3.00GHz</td>
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<tr>
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<td>CPU MHz:</td>
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<td>L1i cache:</td>
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<tr>
<td>L2 cache:</td>
<td>1280K</td>
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<td>L3 cache:</td>
<td>18432K</td>
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<tr>
<td>NUMA node0 CPU(s):</td>
<td>0,2,4,6,8,10,12,14,16,18,20,22</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>1,3,5,7,9,11,13,15,17,19,21,23</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 lm constant_tsc art 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 abalh_abm 3nowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pni ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves cqm_llc cqm_occmap_llc cqm_mbb_total cqm_mbb_local split_lock_detect wboinvd dtherm ida arat pln pts avx512vmbni umip pku ospke avx512_vmbi gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdrpid md_clear pconfig flush_lld arch_capabilities</td>
</tr>
</tbody>
</table>

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 2 4 6 8 10 12 14 16 18 20 22 |
| node 0 size: | 252675 MB |
| node 0 free: | 236202 MB |
| node 1 cpus: | 1 3 5 7 9 11 13 15 17 19 21 23 |
| node 1 size: | 253120 MB |
| node 1 free: | 255863 MB |
| node distances: | |
Dell Inc.  
PowerEdge R750xa (Intel Xeon Gold 5317, 3.00 GHz)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>55</th>
<th>Test Date:</th>
<th>May-2021</th>
</tr>
</thead>
<tbody>
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<td>Test Sponsor:</td>
<td>Dell Inc.</td>
<td>Hardware Availability:</td>
<td>May-2021</td>
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<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Software Availability:</td>
<td>Feb-2021</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_base = 132**  
**SPECspeed®2017_fp_peak = 135**

**Platform Notes (Continued)**

```
node  0  1
  0:  10  20
  1:  20  10
```

From /proc/meminfo

```
MemTotal:       527817140 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): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Melttdown): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swapsgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2017-5715 (Spectre variant 2): Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected
```

(Continued on next page)
Dell Inc.

PowerEdge R750xa (Intel Xeon Gold 5317, 3.00 GHz)

SPECspeed®2017 fp_base = 132
SPECspeed®2017 fp_peak = 135

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

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

Platform Notes (Continued)

run-level 5 May 19 09:24

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.5-ic2021.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 225G 13G 213G 6% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge R750xa
Product Family: PowerEdge
Serial: 1234567

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:
  16x 002C069D002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200, configured at 2933
  16x Not Specified Not Specified

BIOS:
  BIOS Vendor: Dell Inc.
  BIOS Version: 1.2.2
  BIOS Date: 05/14/2021
  BIOS Revision: 1.2

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
  644.nab_s(base)
==============================================================================
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 | 644.nab_s(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.
==============================================================================

(Continued on next page)
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CPU2017 License: 55
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Compiler Version Notes (Continued)

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<td>C</td>
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<td>(Continued on next page)</td>
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**SPEC CPU®2017 Floating Point Speed Result**

**Dell Inc.**

PowerEdge R750xa (Intel Xeon Gold 5317, 3.00 GHz)

**SPECspeed®2017_fp_base = 132**  
**SPECspeed®2017_fp_peak = 135**

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**Compiler Version Notes (Continued)**

Copyright (C) 1985–2020 Intel Corporation. All rights reserved.  
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.

---

**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:

*-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -mbranches-within-32B-boundaries*

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(Continued on next page)
## Dell Inc.

**PowerEdge R750xa (Intel Xeon Gold 5317, 3.00 GHz)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 132</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak = 135</td>
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</table>

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

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

### Base Optimization Flags (Continued)

Fortran benchmarks:
- `-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3`  
- `-no-prec-div -qopt-prefetch -ffinite-math-only`  
- `-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs`  
- `-mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib`  
- `-ljemalloc`

Benchmarks using both Fortran and C:
- `-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
- `-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Benchmarks using Fortran, C, and C++:
- `-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
- `-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

### Peak Compiler Invocation

C benchmarks (except as noted below):
- `icc`

- `644.nab_s: icx`

Fortran benchmarks:
- `ifort`

Benchmarks using both Fortran and C:
- `ifort icc`

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

### Peak Portability Flags

Same as Base Portability Flags
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Peak Optimization Flags

C benchmarks:

619.lbm\_s: basepeak = yes

638.imagick\_s: basepeak = yes


Fortran benchmarks:

603.bwaves\_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -DSPEC\_SUPPRESS\_OPENMP -DSPEC\_OPENMP -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

649.fotonik3d\_s: basepeak = yes

654.roms\_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf\_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -DSPEC\_SUPPRESS\_OPENMP -qopenmp -DSPEC\_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

627.cam4\_s: basepeak = yes

628.pop2\_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactus\_BSSN\_s: basepeak = yes
SPEC CPU®2017 Floating Point Speed Result

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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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