### Dell Inc.

**PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)**

<table>
<thead>
<tr>
<th>SPECspeed&lt;sup&gt;®&lt;/sup&gt;2017_fp_peak</th>
<th>Dell Inc.</th>
<th>SPECspeed&lt;sup&gt;®&lt;/sup&gt;2017_fp_base</th>
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<tbody>
<tr>
<td>113</td>
<td>111</td>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** Apr-2021  
**Hardware Availability:** Jul-2021  
**Tested by:** Dell Inc.  
**Software Availability:** Feb-2021

<table>
<thead>
<tr>
<th>Threads</th>
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</tr>
<tr>
<td>654.roms_s</td>
<td>18</td>
<td>361</td>
</tr>
</tbody>
</table>

#### Hardware

**CPU Name:** Intel Xeon Gold 6354  
**Max MHz:** 3600  
**Nominal:** 3000  
**Enabled:** 18 cores, 1 chip  
**Orderable:** 1 chip  
**Cache L1:** 32 KB I + 48 KB D on chip per core  
**Cache L2:** 1.25 MB I+D on chip per core  
**Cache L3:** 39 MB I+D on chip per chip  
**Other:** None  
**Memory:** 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)  
**Storage:** 225 GB on tmpfs  
**Other:** None

#### Software

**OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
**Version:** 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 0.6.2 released Apr-2021  
**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.
Dell Inc. PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz) SPECspeed®2017_fp_base = 111
SPECspeed®2017_fp_peak = 113

Results Table

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<td>166</td>
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<td>170</td>
</tr>
</tbody>
</table>

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
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.

(Continued on next page)
Dell Inc. PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)

| SPECspeed®2017_fp_base | 111 |
| SPECspeed®2017_fp_peak | 113 |

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

**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 Efficiency Policy: Performance
- Power Management: Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.5-ic2021.1/bin/sysinfo  
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c  
running on localhost.localdomain Wed Apr 28 12:36:18 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

From /proc/cpuinfo
- model name: Intel(R) Xeon(R) Gold 6354 CPU @ 3.00GHz
- 1 "physical id"s (chips)
- 18 "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: 18
- siblings: 18
- physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 18

(Continued on next page)
Dell Inc. PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Apr-2021
Tested by: Dell Inc.

SPECspeed®2017_fp_base = 111
SPECspeed®2017_fp_peak = 113

Platform Notes (Continued)

On-line CPU(s) list: 0-17
Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6354 CPU @ 3.00GHz
Stepping: 6
CPU MHz: 3001.437
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 39936K
NUMA node0 CPU(s): 0-17

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 rdscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref 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_ppn ssbd mba ibrs ibpb stibp ibrs_enhanced fsbsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
clfushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsaveopt
xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local split_lock_detect wbnoinvd
dtherm ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg tme avx512_vpopcntdq 1a57 rdpid md_clear pconfig flush_l1d
arch_capabilities

/procd/cpuinfo cache data
cache size : 39936 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 1 nodes (0)
nodel 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
node 0 size: 493775 MB
node 0 free: 492312 MB
node distances:
nodel 0
0: 10

From /proc/meminfo
MemTotal: 527818536 kB

(Continued on next page)
## Dell Inc. PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)

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<td>113</td>
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</table>

### Platform Notes (Continued)

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

run-level 5 Apr 28 08:42

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
```

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

From /sys/devices/virtual/dmi/id

- **Vendor:** Dell Inc.
- **Product:** PowerEdge XR11
- **Product Family:** PowerEdge
- **Serial:** 09A000K

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 00AD00B300AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200
- 1x 00AD063200AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200
- 3x 00AD069D00AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200

**BIOS:**
- **BIOS Vendor:** Dell Inc.
- **BIOS Version:** 0.6.2
- **BIOS Date:** 04/12/2021
- **BIOS Revision:** 0.6

(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.

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

(Continued on next page)
Dell Inc. PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

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

SPECspeed®2017_fp_base = 111  
SPECspeed®2017_fp_peak = 113

Compiler Version Notes (Continued)

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.
------------------------------------------------------------------------------

C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
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.
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.
Intel(R) Fortran 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.
------------------------------------------------------------------------------

Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran 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.
------------------------------------------------------------------------------

Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran 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.
Dell Inc. PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz) SPECsdp®2017 fp_base = 111
SPECsdp®2017 fp_peak = 113

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

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

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 -gopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries

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 -gopenmp -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
**Dell Inc.**  
PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)  

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**Base Optimization Flags (Continued)**

Benchmarks using both Fortran and C (continued):
- `-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

**Peak Optimization Flags**

C benchmarks:
- `619.lbm_s: basepeak = yes`
- `638.imagick_s: basepeak = yes`

(Continued on next page)
Dell Inc.
PowerEdge XR11 (Intel Xeon Gold 6354, 3.00 GHz)

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

Peak Optimization Flags (Continued)

Fortran benchmarks:

644.nab_s: basepeak = yes
649.fotonik3d_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512
-03 -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:

621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)
-prof-use(pass 2) -ipo -xCORE-AVX512 -03 -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.cactuBSSN_s: 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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Tested with SPEC CPU®2017 v1.1.5 on 2021-04-28 13:36:18-0400.
Originally published on 2021-07-06.