Dell Inc.  
PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)  
SPECrates: 
SPECrates®2017_int_base = 349
SPECrates®2017_int_peak = 362

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

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

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SPECrate®2017_int_base (349)  
SPECrate®2017_int_peak (362)

### Hardware

**CPU Name:** Intel Xeon Gold 6336Y  
**Max MHz:** 3600  
**Nominal:** 2400  
**Enabled:** 48 cores, 2 chips, 2 threads/core  
**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:** 36 MB I+D on chip per chip  
**Other:** None  
**Memory:** 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R)  
**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:** No  
**Firmware:** Version 1.2.4 released May-2021  
**File System:** tmpfs  
**System State:** Run level 5 (graphical multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 32/64-bit  
**Other:** jemalloc memory allocator V5.0.1  
**Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.
Results Table

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</table>

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

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:

```bash
LD_LIBRARY_PATH = 
"/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/lib/ia32:/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/je5.0.1-32"
MALLOCONF = "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
Prior to runcpu invocation
Filesystem page cache synced and cleared with:

```
sync; echo 3> /proc/sys/vm/drop_caches
```

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

Dell Inc.

PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)

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General Notes (Continued)

runcpu command invoked through numacll i.e.:
numactl --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.

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

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 /mnt/ramdisk/cpu2017-1.1.5-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2fc
running on localhost.localdomain Thu Jun  3 10:16:15 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 6336Y CPU @ 2.40GHz
  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

(Continued on next page)
Platform Notes (Continued)

siblings : 48
physical 0: cores 0 1 10 11 12 13 14 15 16 17 18 19 20 21 22 23
physical 1: cores 0 1 10 11 12 13 14 15 16 17 18 19 20 21 22 23

From lscpu:
Architecture: x86_64
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: 106
Model name: Intel(R) Xeon(R) Gold 6336Y CPU @ 2.40GHz
Stepping: 6
CPU MHz: 2807.334
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s):
numa0 0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92
NUMA node1 CPU(s):
numa1 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94
NUMA node2 CPU(s):
numa2 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93
NUMA node3 CPU(s):
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 pdpegb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aerperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrn pdcm pdcid 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_pmm ssbd mbab ibibs ibibs Enhanced fsibase tsc_adjust bmis hle avx2
smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512fma
clflushopt clwb intel_pt avx512cd sha_1_ex avx512bw avx512vl xsaveopt xsavec xgetbv1
xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local split_lock_detect whboinvd
idt dtherm ida arat pln pts avx512vmbi umip kpu ospke avx512vbmi gfnl vaes vpcm1lqdc
avx512_vnni avx512_bitalg tme avx512_vpopcntdq 1a57 rdpid md_clear pconfig flush_l1d
arch_capabilities

(Continued on next page)
Dell Inc.  
PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)

**SPEC CPU®2017 Integer Rate Result**

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---

### Platform Notes (Continued)

```
/proc/cpuinfo cache data
    cache size : 36864 KB

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  4  8  12  16  20  24  28  32  36  40  44  48  52  56  60  64  68  72  76  80  84  88  92
    node 0 size: 125565 MB
    node 0 free: 127154 MB
    node 1 cpus:  2  6  10  14  18  22  26  30  34  38  42  46  50  54  58  62  66  70  74  78  82  86  90  94
    node 1 size: 126456 MB
    node 1 free: 128356 MB
    node 2 cpus:  1  5  9  13  17  21  25  29  33  37  41  45  49  53  57  61  65  69  73  77  81  85  89  93
    node 2 size: 126462 MB
    node 2 free: 114345 MB
    node 3 cpus:  3  7  11  15  19  23  27  31  35  39  43  47  51  55  59  63  67  71  75  79  83  87  91  95
    node 3 size: 126280 MB
    node 3 free: 127975 MB
    node distances:
        node  0   1   2   3
        0:  10  11  20  20
        1:  11  10  20  20
        2:  20  20  10  11
        3:  20  20  11  10

From /proc/meminfo
    MemTotal:       527801048 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
```

(Continued on next page)
## Dell Inc. PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)

### SPEC CPU®2017 Integer Rate Result

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- 55

### Test Sponsor
- Dell Inc.

### Tested by
- Dell Inc.

### Test Date
- Jun-2021

### Hardware Availability
- Jun-2021

### Software Availability
- Feb-2021

### Platform Notes (Continued)

```
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): Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2017-5753 (Spectre variant 1): Mitigation: userscopy/swaps barriers and __user pointer sanitization
- 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 Jun 3 09:51

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

### Additional Information
- Memory:
  - 7x 00AD00B300AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200
  - 9x 00AD063200AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200
  - 16x Not Specified Not Specified

- BIOS:
  - BIOS Vendor: Dell Inc.
  - BIOS Version: 1.2.4
  - BIOS Date: 05/28/2021
```

(Continued on next page)
SPECCPU®2017 Integer Rate Result

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Platform Notes (Continued)

BIOS Revision: 1.2

(End of data from sysinfo program)

Compiler Version Notes

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
2021.1 Build 20201113
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<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)</th>
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<tbody>
<tr>
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<td>525.x264_r(base, peak) 557.xz_r(base, peak)</td>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
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<table>
<thead>
<tr>
<th>C++</th>
<th>520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)</th>
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<td>531.deepsjeng_r(base, peak) 541.leela_r(base, peak)</td>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
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<table>
<thead>
<tr>
<th>Fortran</th>
<th>548.exchange2_r(base, peak)</th>
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(Continued on next page)
Dell Inc.

PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)

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<thead>
<tr>
<th>SPECrate®2017_int_base = 349</th>
<th>SPECrate®2017_int_peak = 362</th>
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<tr>
<td>Dell Inc.</td>
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</tr>
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<td>CPU2017 License: 55</td>
<td>Test Date:</td>
</tr>
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<td>Hardware Availability: Jun-2021</td>
</tr>
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<td>Software Availability: Feb-2021</td>
</tr>
</tbody>
</table>

**Compiler Version Notes (Continued)**

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

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

**Base Portability Flags**

- 500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
- 502.gcc_r: -DSPEC_LP64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
- 525.x264_r: -DSPEC_LP64
- 531.deepsjeng_r: -DSPEC_LP64
- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

**Base Optimization Flags**

C benchmarks:
- -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
- -fno-interprocedural -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries
- -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
- -lqkmalloc

C++ benchmarks:
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4

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

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

500.perlbench_ricc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
SPEC CPU®2017 Integer Rate Result

Dell Inc.

PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)

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Tested by: Dell Inc.

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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: basepeak = yes

The flags files that were used to format this result can be browsed at:

## SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

**PowerEdge R650 (Intel Xeon Gold 6336Y, 2.40 GHz)**

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You can also download the XML flags sources by saving the following links:


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Tested with SPEC CPU®2017 v1.1.5 on 2021-06-03 11:16:15-0400.  
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