**Dell Inc.**

**PowerEdge R750 (Intel Xeon Gold 6336Y, 2.40 GHz)**

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<tr>
<th>Copies</th>
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<tr>
<td></td>
<td>557.xz_r</td>
<td>96</td>
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</tbody>
</table>

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**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 1.2.1 released May-2021
- **File System:** tmpfs
- **System State:** Run level 3 (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>

**SPECrate®2017_int_base = 351**

**SPECrate®2017_int_peak = 364**

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:

```
LD_LIBRARY_PATH = 
"/mnt/ramdisk2/cpu2017-1.1.5-ic2021.1/lib/intel64:/mnt/ramdisk2/cpu2017-1.1.5-ic2021.1/lib/ia32:/mnt/ramdisk2/cpu2017-1.1.5-ic2021.1/je5.0.1-32"
```

```
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

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

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

(Continued on next page)
Dell Inc.
PowerEdge R750 (Intel Xeon Gold 6336Y, 2.40 GHz)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 351
SPECrate®2017_int_peak = 364

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

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

General Notes (Continued)

runcpu command invoked through numactl 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/ramdisk2/cpu2017-1.1.5-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Fri May 14 16:30:44 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)
**SPEC CPU®2017 Integer Rate Result**

**Copyright 2017-2021 Standard Performance Evaluation Corporation**

**Dell Inc.**

*PowerEdge R750 (Intel Xeon Gold 6336Y, 2.40 GHz)*

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** May-2021

**Hardware Availability:** May-2021

**Software Availability:** Feb-2021

---

**SPECrates**

- **SPECrate®2017_int_base = 351**
- **SPECrate®2017_int_peak = 364**

---

**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:** 3155.859
- **BogoMIPS:** 4800.00
- **Virtualization:** VT-x
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 1280K
- **L3 cache:** 36864K

**NUMA node0 CPU(s):**

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):**

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):**

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
- mce
- cmov
-pat
- pse36
- clflush
- dts
- acpi
- mmx
- fxsr
- sse
- sse2
- ss
tm
-ht
- tm
- pbe
- syscalls
- nx
- pdelgb
- rdtscp
- lm
- constant_tsc
- art
- arch_perfmon
- pebs
- bts
- rep_good
- nopl
- xtopology
- nonstop_tsc
- cpuid
- aperfmpref
- pni
- pclmulqdq
- dtes64
- monitor
ds_cpi
- vmx
- smx
- emt2
- sse3
- sdbg
- fma
- cx16
-xtr
- pdcm
- pcmd
- dca
- sse4_1
- sse4_2
- x2apic
- movbe
- popcnt
- tsc_deadline_timer
- aes
- xsave
- avx
- f16c
- rdrnd
- lahf_l1m
- abm
- 3dnowprefetch
- cpuid_fault
- epb
- cat_l3
- invpcid_single
- intel_pmm
- ssbd
- mba
- ibrs
- ibpb
- stibp
- ibrs_enhanced
- fsgsbase
- tsc_adjust
- bmi1
- hle
- avx2
- smep
- bmi2
- erms
- invpcid
- cg
- rdt_a
- avx512f
- avx512dq
- rdseed
- adx
- smap
- avx512ifma
- clflushopt
- clwb
- intel_pt
- avx512cd
- sha
- avx512bw
- avx512vl
- xsaveopt
- xsavec
- xgetbv
- xsaves
- cg
- occ
- mm
- total
- cg
- local
- split
- lock
- detect
- wbo
- inv
- dtherm
- ida
- arat
- pln
- pts
- avx512vbmi
- umip
- pk
- oskp
- avx512_vbmi2
- gfn
- vaes
- vpcm!
- droid
- avx512_vnni
- avx512_bitalg
- tme
- avx512_vpoptd
- la57
- rdpid
- md_clear
- pconfig
- flush_l1d
- arch_capabilities

(Continued on next page)
## Dell Inc.

**PowerEdge R750 (Intel Xeon Gold 6336Y, 2.40 GHz)**

### SPEC CPU®2017 Integer Rate Result

| Test Sponsor | Dell Inc. |
| Test Date | May-2021 |
| Hardware Availability | May-2021 |
| Software Availability | Feb-2021 |

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

### SPECrate®2017_int_base = 351  
SPECrate®2017_int_peak = 364

### 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: 125637 MB  
node 0 free: 113047 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: 126314 MB  
node 1 free: 127722 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: 126190 MB  
node 2 free: 128751 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: 126568 MB  
node 3 free: 128470 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)
SPEC CPU®2017 Integer Rate Result

Dell Inc.
PowerEdge R750 (Intel Xeon Gold 6336Y, 2.40 GHz)

SPECrate®2017_int_base = 351
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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)

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: userrcopy/swapsps barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
CVE-2019-11135 (TSX Asynchronous Abort):

SPEC is set to: /mnt/ramdisk2/cpu2017-1.1.5-ic2021.1
Filesystem     Type   Size  Used Avail Use% Mounted on
tmpfs          tmpfs  225G  6.9G  219G   4% /mnt/ramdisk2

From /sys/devices/virtual/dmi/id
Vendor:        Dell Inc.
Product:       PowerEdge R750
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:
12x 002C069D002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200
4x 00AD063200AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200
16x Not Specified Not Specified

BIOS:
BIOS Vendor:    Dell Inc.
BIOS Version:   1.2.1
BIOS Date:      05/06/2021
BIOS Revision:  1.2

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

(End of data from sysinfo program)

**Compiler Version Notes**

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

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### Compiler Version Notes (Continued)

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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.

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Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on

(Continued on next page)
Dell Inc.  
PowerEdge R750 (Intel Xeon Gold 6336Y, 2.40 GHz)  

SPEC CPU®2017 Integer Rate Result  
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SPECrate®2017_int_base = 351  
SPECrate®2017_int_peak = 364

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

Compiler Version Notes (Continued)

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  
-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  
-mbranches-within-32B-boundaries

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-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
-qqopt-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_r: icc

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
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### 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`  
  `-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`

- **523.xalancbmk_r**: `basepeak = yes`

- **531.deepsjeng_r**: `basepeak = yes`

- **541.leela_r**: `basepeak = yes`

#### Fortran benchmarks:

- **548.exchange2_r**: `basepeak = yes`

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

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<thead>
<tr>
<th>SPECrate®2017_int_base</th>
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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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