# SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

**PowerEdge XR12 (Intel Xeon Gold 6314U, 2.30 GHz)**

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OS:</strong> Red Hat Enterprise Linux 8.3 (Ootpa)</td>
<td><strong>CPU Name:</strong> Intel Xeon Gold 6314U</td>
</tr>
<tr>
<td><strong>Compiler:</strong> C/C++: Version 2021.1 of Intel oneAPI DPC++/C++</td>
<td><strong>Max MHz:</strong> 3400</td>
</tr>
<tr>
<td><strong>Compiler Build 20201113 for Linux:</strong></td>
<td><strong>Nominal:</strong> 2300</td>
</tr>
<tr>
<td><strong>Fortran:</strong> Version 2021.1 of Intel Fortran Compiler</td>
<td><strong>Enabled:</strong> 32 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td><strong>Classic Build 20201112 for Linux:</strong></td>
<td><strong>Orderable:</strong> 1 chip</td>
</tr>
<tr>
<td><strong>C/C++:</strong> Version 2021.1 of Intel C/C++ Compiler</td>
<td><strong>Cache L1:</strong> 32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Classic Build 20201112 for Linux:</strong></td>
<td><strong>L2:</strong> 1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td><strong>Parallel:</strong> No</td>
<td><strong>L3:</strong> 48 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Firmware:</strong> Version 0.6.2 released Apr-2021</td>
<td><strong>Other:</strong> None</td>
</tr>
<tr>
<td><strong>File System:</strong> tmpfs</td>
<td><strong>Memory:</strong> 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td><strong>System State:</strong> Run level 5 (graphical multi-user)</td>
<td><strong>Storage:</strong> 225 GB on tmpfs</td>
</tr>
<tr>
<td><strong>Base Pointers:</strong> 64-bit</td>
<td><strong>Other:</strong> None</td>
</tr>
<tr>
<td><strong>Peak Pointers:</strong> 32/64-bit</td>
<td></td>
</tr>
<tr>
<td><strong>Other:</strong> jemalloc memory allocator V5.0.1</td>
<td></td>
</tr>
<tr>
<td><strong>Power Management:</strong> BIOS and OS set to prefer performance at the cost of additional power usage.</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 221</th>
<th>SPECrate®2017_int_peak = 229</th>
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<tr>
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<tr>
<td>500.perlbach_r</td>
<td>155</td>
<td>182</td>
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<tr>
<td>502.gcc_r</td>
<td>175</td>
<td>208</td>
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<tr>
<td>505.mcf_r</td>
<td>133</td>
<td>354</td>
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<tr>
<td>520.omnetpp_r</td>
<td>273</td>
<td>466</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>173</td>
<td>489</td>
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<tr>
<td>525.x264_r</td>
<td>170</td>
<td>458</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>125</td>
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<tr>
<td>541.leela_r</td>
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<tr>
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<td>125</td>
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**Tested by:** Dell Inc.

**Software Availability:** Feb-2021
**Hardware Availability:** Jul-2021

**Copyright 2017-2021 Standard Performance Evaluation Corporation**
## Results Table

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<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
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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/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)
General Notes (Continued)

runcpu command invoked through numacl 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 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Wed Apr 21 04:14:57 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 6314U CPU @ 2.30GHz
  1 "physical id"s (chips)
  64 "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 : 32

(Continued on next page)
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CPU2017 License: 55
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Test Date: Apr-2021
Hardware Availability: Jul-2021
Software Availability: Feb-2021

Platform Notes (Continued)

siblings : 64
physical 0: cores 0 1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 1
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6314U CPU @ 2.30GHz
Stepping: 6
CPU MHz: 3021.762
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s):
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58
,60,62
NUMA node1 CPU(s):
1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59
,61,63
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 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
xtrig pdcm pclid 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_pinn 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 xsavec xgetbv1
xsavecx save cmx_mm64 cqm_occupa llc cqm_mbb_total cqm_mbb_local split_lock_detect
wbinvd dtherm ida arat pln pts avx512vmbi umip pku ospe avx512_vmbi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg tme avx512_vpopcndtq la57 rdpid md_clear pconfi flush_lid
arch_capabilities

/proc/cpuinfo cache data

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

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PowerEdge XR12 (Intel Xeon Gold 6314U, 2.30 GHz)  

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<td>Tested by: Dell Inc.</td>
<td>Software Availability: Feb-2021</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

```
cache size : 49152 KB

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 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62
node 0 size: 248393 MB
node 0 free: 241553 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63
node 1 size: 248916 MB
node 1 free: 256571 MB
node distances:
  node 0 1
  0: 10 11
  1: 11 10

From /proc/meminfo
MemTotal: 527808252 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
```

(Continued on next page)
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Platform Notes (Continued)

- 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: usercopy/swapgs 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 Apr 21 04:13

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

Filesystem     Type   Size  Used Avail Use% Mounted on
tmpfs          tmpfs  225G  7.0G  219G   4% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor:         Dell Inc.
Product:        PowerEdge XR12
Product Family: PowerEdge
Serial:         0990104

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:
- 5x 002C0632002C 36ASF8G72FZ-3G2B2 64 GB 2 rank 3200
- 3x 00CE063200CE M393A8G40AB2-CWE 64 GB 2 rank 3200

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

Compiler Version Notes

==============================================================================
| C       | 500.perlbench_r(peak) |
-----------------------------------------------------------------------------

(Continued on next page)
### Compiler Version Notes (Continued)

<table>
<thead>
<tr>
<th>C</th>
<th>502.gcc_r(peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113</td>
<td></td>
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<tr>
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C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak) 541.leela_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 | 548.exchange2_r(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.
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SPEC CPU®2017 Integer Rate Result

Dell Inc.

PowerEdge XR12 (Intel Xeon Gold 6314U, 2.30 GHz)

SPECrare®2017_int_base = 221
SPECrare®2017_int_peak = 229

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

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
-fflat -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
-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

(Continued on next page)
### Base Optimization Flags (Continued)

Fortran benchmarks (continued):

- `-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`

### Peak Optimization Flags

C benchmarks:


(Continued on next page)
Dell Inc.

PowerEdge XR12 (Intel Xeon Gold 6314U, 2.30 GHz)

SPEC CPU®2017 Integer Rate Result

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Peak Optimization Flags (Continued)

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

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
# SPEC CPU®2017 Integer Rate Result

Dell Inc.  
PowerEdge XR12 (Intel Xeon Gold 6314U, 2.30 GHz)  

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.5 on 2021-04-21 05:14:57-0400.  
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