### Dell Inc.

PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)

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<th>OS:</th>
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<td>Compiler:</td>
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## Dell Inc.

PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)

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

### Results Table

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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,scatter"
- `LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
- `OMP_STACKSIZE = "192M"

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5

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.

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

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CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Jan-2020
Tested by: Dell Inc.
Software Availability: Jun-2019
Hardware Availability: Feb-2020

**Platform Notes**

BIOS settings:
Sub NUMA Cluster disabled
Virtualization Technology disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
Logical Processor disabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
UPI Prefetch enabled
LLC Prefetch disabled
Dead Line LLC Alloc enabled
Directory AtoS disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe6e46a485a0011
running on linux-g3ob Thu Jan 16 11:55:28 2020

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 6240R CPU @ 2.40GHz
  2 "physical id"s (chips)
  48 "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
siblings : 24
physical 0: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
```

(Continued on next page)
SPEC CPU®2017 Integer Speed Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.
PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)

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Platform Notes (Continued)

NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6240R CPU @ 2.40GHz
Stepping: 7
CPU MHz: 2400.000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
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
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
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
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 cdp_l3
invpcid_single intel_pmi ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vtun
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occp llc cqm_mbb_total

cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_lld
arch_capabilities

/proc/cpuinfo cache data
  cache size : 36608 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
  node 0 size: 192042 MB
  node 0 free: 191701 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
  node 1 size: 193530 MB
  node 1 free: 192714 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

(Continued on next page)
Platform Notes (Continued)

From /proc/meminfo
   MemTotal:       394826428 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP1"
      VERSION_ID="15.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp1"

   uname -a:
      Linux linux-g3ob 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
      x86_64 x86_64 x86_64 GNU/Linux

   Kernel self-reported vulnerability status:

   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: __user pointer sanitization
   CVE-2017-5715 (Spectre variant 2):        Mitigation: Enhanced IBRS, IBPB: conditional,
                                         RSB filling

   run-level 3 Jan 16 05:48 last=5

   SPEC is set to: /home/cpu2017
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda2      xfs   440G   52G  389G  12% /

   From /sys/devices/virtual/dmi/id
      BIOS:    Dell Inc. 2.5.4 01/13/2020
      Vendor:  Dell Inc.
      Product: PowerEdge R740xd
      Product Family: PowerEdge
      Serial:  F5BMCS2

   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
Dell Inc.

PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)

SPEC CPU®2017 Integer Speed Result

SPECspeed®2017_int_base = 10.3
SPECspeed®2017_int_peak = 10.5

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

Test Date: Jan-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Platform Notes (Continued)

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
Memory:
12x 002C069D002C 18ASF2G72PDZ-2G9E1 16 GB 2 rank 2933
7x 00AD00B300AD HMA82GR7CJR8N-WM 16 GB 2 rank 2933
5x 00AD063200AD HMA82GR7CJR8N-WM 16 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

C       | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
        | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64
## SPEC CPU®2017 Integer Speed Result

### Dell Inc.

**PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)**

<table>
<thead>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

**Test Date:** Jan-2020  
**Hardware Availability:** Feb-2020  
**Software Availability:** Jun-2019

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### Base Compiler Invocation (Continued)

- Fortran benchmarks: `ifort -m64`

### Base Portability Flags

- `600.perlbench_s`: `-DSPEC_LP64 -DSPEC_LINUX_X64`
- `602.gcc_s`: `-DSPEC_LP64`
- `605.mcf_s`: `-DSPEC_LP64`
- `620.omnetpp_s`: `-DSPEC_LP64`
- `623.xalancbmk_s`: `-DSPEC_LP64 -DSPEC_LINUX`
- `625.x264_s`: `-DSPEC_LP64`
- `631.deepsjeng_s`: `-DSPEC_LP64`
- `641.leela_s`: `-DSPEC_LP64`
- `648.exchange2_s`: `-DSPEC_LP64`
- `657.xz_s`: `-DSPEC_LP64`

### Base Optimization Flags

- C benchmarks:
  - `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP`
  - `-L/usr/local/je5.0.1-64/lib -ljemalloc`

- C++ benchmarks:
  - `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=4`
  - `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
  - `-lqkmalloc`

- Fortran benchmarks:
  - `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4`
  - `-nostandard-realloc-lhs`

### Peak Compiler Invocation

- C benchmarks:
  - `icc -m64 -std=c11`

- C++ benchmarks:
  - `icpc -m64`
## Dell Inc.

**PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)**

<table>
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<td>Hardware Availability: Feb-2020</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Jun-2019</td>
</tr>
</tbody>
</table>

### Peak Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

#### C benchmarks:

- **600.perlbench_s**: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc

- **602.gcc_s**: basepeak = yes

- **605.mcf_s**: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

- **625.x264_s**: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

- **657.xz_s**: basepeak = yes

#### C++ benchmarks:

- **620.omnetpp_s**: basepeak = yes

- **623.xalancbmk_s**: basepeak = yes

- **631.deepsjeng_s**: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

(Continued on next page)
Dell Inc.

PowerEdge R740xd (Intel Xeon Gold 6240R, 2.40 GHz)

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CPU2017 License: 55
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Test Date: Jan-2020
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Peak Optimization Flags (Continued)

641.leela_s: Same as 631.deepsjeng_s

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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:

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