# Dell Inc.

PowerEdge R740xd (Intel Xeon Gold 6242R, 3.10 GHz)

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<tr>
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<th>SPECspeed®2017_fp_peak</th>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** Jan-2020  
**Hardware Availability:** Feb-2020

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<td>654.roms_s</td>
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**Software**

- **OS:** SUSE Linux Enterprise Server 15 SP1  
  kernel 4.12.14-195-default
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux
- **Parallel:** Yes
- **Firmware:** Version 2.5.4 released Jan-2020
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

---

**Hardware**

- **CPU Name:** Intel Xeon Gold 6242R  
  Max MHz: 4100  
  Nominal: 3100  
  Enabled: 40 cores, 2 chips  
  Orderable: 1.2 chips  
  Cache L1: 32 KB I + 32 KB D on chip per core  
  L2: 1 MB I+D on chip per core  
  L3: 35.75 MB I+D on chip per chip  
  Other: None  
  Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933V-R, running at 2933)
- **Storage:** 1 x 1.92 TB SATA SSD  
  Other: None
Dell Inc.

PowerEdge R740xd (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_fp_base = 150
SPECspeed®2017_fp_peak = 151

Results Table

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<td>104</td>
<td>150</td>
<td>104</td>
<td>152</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 = "/home/cpu2017/lib/intel64"
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
**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 Mon Jan 20 14:13:39 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 6242R CPU @ 3.10GHz
- 2 "physical id"s (chips)
- 40 "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 : 20
- siblings : 20
- physical 0: cores 0 1 3 5 6 8 10 12 13 16 17 18 19 20 21 25 26 27 28 29
- physical 1: cores 0 1 2 4 5 6 8 9 10 11 12 13 16 17 18 19 21 26 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): 40
- On-line CPU(s) list: 0-39
- Thread(s) per core: 1
- Core(s) per socket: 20
- Socket(s): 2

(Continued on next page)
Dell Inc. PowerEdge R740xd (Intel Xeon Gold 6242R, 3.10 GHz)

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

SPECspeed®2017_fp_base = 150
SPECspeed®2017_fp_peak = 151

Platform Notes (Continued)

NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6242R CPU @ 3.10GHz
Stepping: 7
CPU MHz: 3100.000
BogoMIPS: 6200.00
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
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
       pat pse36 clflush dts acp1 mmx fxsr sse sse2 ss ht tm tm2 pbe syscall nx pdpe1gb rdtsscp
       lm constant_tsc aarch64 arch_perfmon npt numalticks cpuid tsc_cotope watchdog xsave
       xaes xsaveopt xsavec xGetsv eax128huge
       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
   node 0 size: 192072 MB
   node 0 free: 184656 MB
   node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
   node 1 size: 193501 MB
   node 1 free: 192755 MB
   node distances:
      node 0  1
      0: 10  21
      1: 21 10

From /proc/meminfo
  MemTotal: 394827936 KB

(Continued on next page)
Dell Inc.  
PowerEdge R740xd (Intel Xeon Gold 6242R, 3.10 GHz)  

**Platform Notes (Continued)**

```
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 20 03:49 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
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
  Memory:

(Continued on next page)
## Dell Inc.

**PowerEdge R740xd (Intel Xeon Gold 6242R, 3.10 GHz)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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<td>SPECspeed®2017_fp_peak</td>
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</table>

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

### Platform Notes (Continued)

```
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

```plaintext
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<td>1985-2019 Intel Corporation</td>
<td>All rights reserved.</td>
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<td>applications running on Intel(R) 64,</td>
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<td>Version 19.0.4.227 Build 20190416</td>
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SPECspeed®2017_fp_base = 150  
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CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  

Compiler Version Notes (Continued)  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
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.  
------------------------------------------------------------------------------

Base Compiler Invocation  
C benchmarks:  
icc -m64 -std=c11

Fortran benchmarks:  
ifort -m64

Benchmarks using both Fortran and C:  
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:  
icpc -m64 icc -m64 -std=c11 ifort -m64

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:  
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

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

For Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
Dell Inc. 
PowerEdge R740xd (Intel Xeon Gold 6242R, 3.10 GHz)

**SPEC CPU®2017 Floating Point Speed Result**

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**Peak Optimization Flags (Continued)**

- 638.imagick_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
  -DSPEC_OPENMP

- 644.nab_s: Same as 638.imagick_s

**Fortran benchmarks:**

- 603.bwaves_s: basepeak = yes
- 649.fotonik3d_s: basepeak = yes
- 654.roms_s: basepeak = yes

**Benchmarks using both Fortran and C:**

- 621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
  -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
  -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp
  -DSPEC_OPENMP -nostandard-realloc-lhs

- 627.cam4_s: basepeak = yes

- 628.pop2_s: Same as 621.wrf_s

**Benchmarks using Fortran, C, and C++:**

- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
  -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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Tested with SPEC CPU®2017 v1.1.0 on 2020-01-20 15:13:38-0500.
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