Dell Inc.

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)

SPECspeed®2017_int_base = 11.1
SPECspeed®2017_int_peak = 11.4

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

Test Date: May-2021
Hardware Availability: Jul-2021

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: Yes
Firmware: Version 0.9.0 released May-2021
File System: tmpfs
System State: Run level 5 (graphical multi-user)
Base Pointers: 64-bit
Peak Pointers: 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.

Hardware
CPU Name: Intel Xeon Silver 4314
Max MHz: 3400
Nominal: 2400
Enabled: 16 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 24 MB I+D on chip per chip
Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R, running at
2666)
Storage: 225 GB on tmpfs
Other: None

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>perlbench_s</td>
<td>16</td>
<td>6.99</td>
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<td>gcc_s</td>
<td>16</td>
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<td>10.8</td>
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<tr>
<td>mcf_s</td>
<td>16</td>
<td>9.64</td>
<td>19.8</td>
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<tr>
<td>omnetpp_s</td>
<td>16</td>
<td>13.2</td>
<td>16.5</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>16</td>
<td>5.77</td>
<td>18.8</td>
</tr>
<tr>
<td>x264_s</td>
<td>16</td>
<td>4.71</td>
<td>18.6</td>
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SPECspeed®2017_int_base (11.1)  ----  SPECspeed®2017_int_peak (11.4)
Dell Inc.

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)

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

SPECspeed®2017_int_base = 11.1
SPECspeed®2017_int_peak = 11.4

Results Table

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<tr>
<th>Benchmark</th>
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<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
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<td>657.xz_s</td>
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<td>18.6</td>
<td>332</td>
<td>18.6</td>
<td>332</td>
<td>18.6</td>
</tr>
</tbody>
</table>

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 = "/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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
ejemalloc, 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.

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

**Dell Inc.**

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)  

<table>
<thead>
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<td>Dell Inc.</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base = 11.1**  
**SPECspeed®2017_int_peak = 11.4**

---

**General Notes (Continued)**

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:**
- Logical Processor : Disabled
- 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 Efficiency Policy**
- Performance

**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 May 19 05:34:33 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) Silver 4314 CPU @ 2.40GHz
  - 1 "physical id"s (chips)
  - 16 "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 : 16
    - siblings : 16
    - physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

- From lscpu:
  - Architecture: x86_64
  - CPU op-mode(s): 32-bit, 64-bit
  - Byte Order: Little Endian
  - CPU(s): 16

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

**Dell Inc.**

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)

!![](https://www.spec.org/)

<table>
<thead>
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<tbody>
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<td>SPECspeed®2017_int_peak</td>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

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

---

### Platform Notes (Continued)

- **On-line CPU(s) list:** 0-15  
- **Thread(s) per core:** 1  
- **Core(s) per socket:** 16  
- **Socket(s):** 1  
- **NUMA node(s):** 1  
- **Vendor ID:** GenuineIntel  
- **CPU family:** 6  
- **Model:** 106  
- **Model name:** Intel(R) Xeon(R) Silver 4314 CPU @ 2.40GHz  
- **Stepping:** 6  
- **CPU MHz:** 2820.946  
- **BogoMIPS:** 4800.00  
- **Virtualization:** VT-x

**L1d cache:** 48K  
**L1i cache:** 32K  
**L2 cache:** 1280K  
**L3 cache:** 24576K  
**NUMA node0 CPU(s):** 0-15  
**Flags:** fpu vme de pse tsc msr pae mce 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 copuid_fault epb cat_l3 invpcid_single intel_pni ssbd mba ibrs ibpb stibp ibrs_counter fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cmip rdt_a avx512ifma clflushopt clwb intel_pt intel_ptx avx1 avx2 f16c rdrand vcvnvl xsaveopt xsavePRETTY xmodrm xsavec xsaveprec tx64_bbox vsx mackit vsx Nixon cmpxchg16b arch_capabilities

```
/proc/cpuinfo cache data
  cache size : 24576 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.  
**available:** 1 nodes (0)  
**node 0 cpus:** 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
**node 0 size:** 500186 MB  
**node 0 free:** 498425 MB  
**node distances:**  
  **node 0:**  
  **0:** 10

From /proc/meminfo
```
MemTotal: 527818980 kB
```

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

Dell Inc.

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)

SPECspeed®2017_int_base = 11.1
SPECspeed®2017_int_peak = 11.4

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

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

Platform Notes (Continued)

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
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: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2017-5715 (Spectre variant 2): Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 May 19 05:30

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

(Continued on next page)
## Dell Inc.

**PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)**

<table>
<thead>
<tr>
<th>SPECspeed\textsuperscript{®}2017_int_peak</th>
<th>SPECspeed\textsuperscript{®}2017_int_base</th>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** May-2021  
**Hardware Availability:** Jul-2021  
**Tested by:** Dell Inc.  
**Software Availability:** Feb-2021

### Platform Notes (Continued)

From /sys/devices/virtual/dmi/id  
**Vendor:** Dell Inc.  
**Product:** PowerEdge XR11  
**Product Family:** PowerEdge  
**Serial:** 09A000K  

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:**
- 4x 00AD00B300AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200, configured at 2666  
- 1x 00AD063200AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200, configured at 2666  
- 3x 00AD069D00AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200, configured at 2666

**BIOS:**
- **BIOS Vendor:** Dell Inc.  
- **BIOS Version:** 0.9.0  
- **BIOS Date:** 05/10/2021  
- **BIOS Revision:** 0.9

(End of data from sysinfo program)

### Compiler Version Notes

```plaintext
C       | 600.perlbench_s(peak)

Intel(R) C 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.

C       | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(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.

C       | 600.perlbench_s(peak)

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
```

(Continued on next page)
Dell Inc.

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)

**SPEC CPU®2017 Integer Speed Result**

Copyright 2017-2021 Standard Performance Evaluation Corporation

---

**Compiler Version Notes (Continued)**

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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**Base Compiler Invocation**

C benchmarks:
- icx

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

---

**SPECspeed®2017_int_base = 11.1**

**SPECspeed®2017_int_peak = 11.4**
### 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:**

```
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX512
-03 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

**C++ benchmarks:**

```
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-ff1lo -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:**

```
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
```

### Peak Compiler Invocation

**C benchmarks (except as noted below):**

```
icx
```

```
600.perlbench_s: icc
```

**C++ benchmarks:**

```
icpx
```
### Peak Compiler Invocation (Continued)

**Fortran benchmarks:**

`ifort`

### 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)
  -xCORE-AVX512 -ipo -O3 -no-prec-div
  -qopt-mem-layout-trans=4 -fno-strict-overflow
  -mbranches-within-32B-boundaries
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

- `602.gcc_s`: `-m64 -std=c11 -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/jemalloc64-5.0.1/lib -ljemalloc`

- `605.mcf_s`: `basepeak = yes`

- `625.x264_s`: `-DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs
  -xCORE-AVX512 -flto -O3 -ffast-math
  -qopt-mem-layout-trans=4 -fno-alias
  -mbranches-within-32B-boundaries
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

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

**C++** benchmarks:

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

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

- `631.deepsjeng_s`: `basepeak = yes`
# SPEC CPU®2017 Integer Speed Result

**Dell Inc.**

PowerEdge XR11 (Intel Xeon Silver 4314, 2.40 GHz)

### SPECspeed®2017

- **int_base** = 11.1
- **int_peak** = 11.4

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

### Peak Optimization Flags (Continued)

- 641.leela_s: basepeak = yes
- **Fortran benchmarks:**
  - 648.exchange2_s: 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:


---

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

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