SPEC CPU®2017 Integer Speed Result

Dell Inc.
PowerEdge T550 (Intel Xeon Silver 4314, 2.40 GHz)

Copyright 2017-2021 Standard Performance Evaluation Corporation

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: Nov-2021
Hardware Availability: Oct-2021

Software Availability: May-2021

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
</tr>
<tr>
<td>602.gcc_s</td>
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<td>32</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Silver 4314
Max MHz: 3400
Nominal: 2400
Enabled: 32 cores, 2 chips
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: 24 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R, running at 2666)
Storage: 125 GB on tmpfs
Other: None

Software

OS: Red Hat Enterprise Linux 8.4 (Ootpa)
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 1.3.7 released Jul-2021
File System: tmpfs
System State: Run level 3 (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.
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Results Table

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<tr>
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<th>Threads</th>
<th>Seconds</th>
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<th>Ratio</th>
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<th>Ratio</th>
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<tbody>
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<td>641.leela_s</td>
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<td>287</td>
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<td>21.5</td>
<td></td>
<td></td>
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<td></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/cpu2017-1.1.8-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2021.1/je5.0.1-64"
MALLOCS_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

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 T550 (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.

**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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G 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 Bus Link Power Management : Disabled
- PCI ASPM L1 Link Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-ic2021.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca61ec4f
running on localhost.localdomain Tue Nov 9 05:01:24 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
2 physical id"s (chips)
32 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
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu from util-linux 2.32.1:

Architecture: x86_64

(Continued on next page)
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SPECspeed®2017_int_base = 11.1
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CPU2017 License: 55
Test Sponsor: Dell Inc.
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Platform Notes (Continued)

CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Silver 4314 CPU @ 2.40GHz
BIOS Model name: Intel(R) Xeon(R) Silver 4314 CPU @ 2.40GHz
Stepping: 6
CPU MHz: 2361.681
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 24576K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmovpat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc 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 invpcid_single intel_poor icmp ssbd mba ibrs ibpb stibp ibrs Enhanced fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invncid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaves cmq_llc cmq_mbm_total cmq_mbm_local split_lock_detect wbinvd dwm dtherm ida pln pts avx512vmbi umip pkpu ospke avx512_vmbi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid fsrm md_clear pconfug flush_lld 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: 2 nodes (0-1)
   node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
   node 0 size: 257182 MB
   node 0 free: 248400 MB

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

node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
node 1 size: 258004 MB
node 1 free: 257225 MB
node distances:
node 0 1
0: 10 20
1: 20 10

From /proc/meminfo
MemTotal: 527552152 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="8.4 (Ootpa)"
ID="rheil"
ID_LIKE="fedora"
VERSION_ID="8.4"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.4:ga

uname -a:
Linux localhost.localdomain 4.18.0-305.el8.x86_64 #1 SMP Thu Apr 29 08:54:30 EDT 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/swapsgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1):
Mitigation: Enhanced IBRS, IBPB:
CVE-2017-5715 (Spectre variant 2):
Dell Inc. | SPEC CPU®2017 Integer Speed Result
---|---
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### Platform Notes (Continued)

conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Nov 9 04:58

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-ic2021.1

Filesystem | Type | Size | Used | Avail | Use% | Mounted on
---|---|---|---|---|---|---
tmpfs | tmpfs | 125G | 4.1G | 121G | 4% | /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge T550
Product Family: PowerEdge
Serial: 3LM1509

Additional information from dmidecode 3.2 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:
16x 002C00B3002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200, configured at 2666

BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 1.3.7
BIOS Date: 07/30/2021
BIOS Revision: 1.3

(End of data from sysinfo program)

### Compiler Version Notes

---

**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,

(Continued on next page)
Dell Inc.
PowerEdge T550 (Intel Xeon Silver 4314, 2.40 GHz)

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**Compiler Version Notes (Continued)**

Version 2021.1 Build 20201113  
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**Base Compiler Invocation**

**C benchmarks:**  
icx

**C++ benchmarks:**  
icpx

---

(Continued on next page)
Dell Inc. PowerEdge T550 (Intel Xeon Silver 4314, 2.40 GHz)

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### Base Compiler Invocation (Continued)

Fortran benchmarks:

```plaintext
ifort
```

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>-DSPEC_LP64</td>
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<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

**C benchmarks:**

-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX512
-O3 -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
-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:**

-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):

```plaintext
icx
```

(Continued on next page)
Dell Inc.
PowerEdge T550 (Intel Xeon Silver 4314, 2.40 GHz)

Peak Compiler Invocation (Continued)

600.perlbench_s: icc

C++ benchmarks:
  icpx

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:

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

## Dell Inc.

### PowerEdge T550 (Intel Xeon Silver 4314, 2.40 GHz)

### SPECspeed®2017 Integer Results

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

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### CPU2017 License: 55

- **Test Sponsor**: Dell Inc.
- **Test Date**: Nov-2021
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- **Tested by**: Dell Inc.
- **Software Availability**: May-2021

### Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

For 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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