# SPEC® CPU2017 Integer Rate Result

**Dell Inc.**

**PowerEdge R540 (Intel Xeon Silver 4109T, 2.00 GHz)**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
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</thead>
<tbody>
<tr>
<td><strong>70.0</strong></td>
<td><strong>Not Run</strong></td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Nov-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

## Hardware
- **CPU Name:** Intel Xeon Silver 4109T  
- **Max MHz.:** 3000  
- **Nominal:** 2000  
- **Enabled:** 16 cores, 2 chips, 2 threads/core  
- **Orderable:** 1.2 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 11 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
- **Storage:** 480 GB SATA SSD  
- **Other:** None

## Software
- **OS:** SUSE Linux Enterprise Server 12 SP2  
  4.4.21-69-default  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
  Compiler for Linux:  
  Fortran: Version 18.0.0.128 of Intel Fortran  
- **Parallel:** No  
- **Firmware:** Version 1.3.0 released Sep-2017  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** jemalloc: jemalloc memory allocator library V5.0.1;  
  jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;  
  jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;  
  jemalloc: sources available via jemalloc.net

<table>
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<tr>
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<tr>
<td>641</td>
<td>87.2</td>
<td>144</td>
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<tr>
<td>477</td>
<td>73.9</td>
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<tr>
<td>60.3</td>
<td>132</td>
<td>129</td>
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<tr>
<td>54.4</td>
<td>129</td>
<td>129</td>
</tr>
<tr>
<td>48.1</td>
<td>129</td>
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Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
Dell Inc.

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Results Table

<table>
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<tr>
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<tr>
<td>500.perlbench_r</td>
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<td>48.0</td>
<td>718</td>
<td>48.1</td>
</tr>
</tbody>
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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"

General Notes

Environment variables set by runcpu before the start of the run:

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

Platform Notes

BIOS settings:
Logical Processor Enabled

(Continued on next page)
# SPEC CPU2017 Integer Rate Result

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### PowerEdge R540 (Intel Xeon Silver 4109T, 2.00 GHz)

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### SPECrate2017_int_base = 70.0

### SPECrate2017_int_peak = Not Run

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## Platform Notes (Continued)

- Virtualization Technology Disabled
- Sub NUMA Cluster Enabled
- System Profile set to Custom
- CPU Performance set to Maximum Performance
- C1E Disabled
- C States set to Autonomous
- Uncore Frequency set to Dynamic
- Memory Patrol Scrub Disabled
- Energy Efficiency Policy set to Performance
- CPU Interconnect Bus Link Power Management Disabled
- PCI ASPM L1 Link Power Management Disabled
- Sysinfo program /root/cpu2017/bin/sysinfo
- Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
- running on linux-oq9t Tue Nov 14 17:23:01 2017

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 4109T CPU @ 2.00GHz
  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 : 8
  siblings : 16
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7
```

From lscpu:

```
Architecture:       x86_64
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: 2
Core(s) per socket: 8
Socket(s):         2
NUMA node(s):      2
Vendor ID:         GenuineIntel
CPU family:        6
Model:             85
Model name:        Intel(R) Xeon(R) Silver 4109T CPU @ 2.00GHz
Stepping:          4
CPU MHz:           1995.407
BogoMIPS:          3990.81
```

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Platform Notes (Continued)

Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
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 cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpm pdcml pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm intel_pt
tpr_shadow vmm_vnx flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
erms invpcid rtm cqm avx512f avx512dq avx512vd avx512vpm avx512vcl avx512bw
avx512vl xsaveopt xsaves opt xgetbv1 cqm_llc cqm_occup_llc

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: 96285 MB
node 0 free: 95836 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
node 1 size: 96736 MB
node 1 free: 96298 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 197654280 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2

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**Platform Notes (Continued)**

# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

```plaintext
os-release:
NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"
```

```plaintext
uname -a:
Linux linux-oq9t 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Nov 14 17:20

SPEC is set to: /root/cpu2017

```plaintext
Filesystem  Type  Size  Used  Avail  Use% Mounted on
/dev/sda2      xfs   301G  51G  250G  17%  /
```

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.

```plaintext
BIOS Dell Inc. 1.2.9 10/06/2017
Memory:
  12x 00AD063200AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666, configured at 2400
  4x Not Specified Not Specified
```

(End of data from sysinfo program)

**Compiler Version Notes**

```plaintext
-- cc  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
   557.xz_r(base)
--
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
--
-- cxxc 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
   541.leela_r(base)
```

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Compiler Version Notes (Continued)

icpc (ICC) 18.0.0 20170811
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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

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:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

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Base Optimization Flags (Continued)

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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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