Dell Inc. PowerEdge R540 (Intel Xeon Silver 4114, 2.20GHz)

CPU2017 License: 55  Test Date: Dec-2018
Test Sponsor: Dell Inc.  Hardware Availability: May-2018
Tested by: Dell Inc.  Software Availability: Apr-2018

<table>
<thead>
<tr>
<th>600.perlbench_s</th>
<th>20</th>
<th>5.02</th>
<th>7.48</th>
</tr>
</thead>
<tbody>
<tr>
<td>602.gcc_s</td>
<td>20</td>
<td></td>
<td>9.02</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>20</td>
<td></td>
<td>4.48</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>20</td>
<td></td>
<td>9.26</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>20</td>
<td></td>
<td>4.23</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>20</td>
<td></td>
<td>3.52</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>20</td>
<td></td>
<td>10.7</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Threads (7.00) SPECspeed2017_int_base = 7.00

Hardware
CPU Name: Intel Xeon Silver 4114
Max MHz.: 3000
Nominal: 2200
Enabled: 20 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: 13.75 MB I+D on chip per chip
Other: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
Storage: 1 x 960 GB SATA SSD

Software
OS: SUSE Linux Enterprise Server 12 SP3
Compiler: C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux;
Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux
Parallel: Yes
Firmware: Version 1.4.8 released May-2018
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator v5.0.1
SPEC CPU2017 Integer Speed Result

Dell Inc.
PowerEdge R540 (Intel Xeon Silver 4114, 2.20GHz)

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 7.00
SPECspeed2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>20</td>
<td>354</td>
<td>5.01</td>
<td>353</td>
<td>5.03</td>
<td>353</td>
<td>5.02</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>20</td>
<td>532</td>
<td>7.49</td>
<td>537</td>
<td>7.42</td>
<td>533</td>
<td>7.48</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>20</td>
<td>524</td>
<td>9.01</td>
<td>524</td>
<td>9.02</td>
<td>523</td>
<td>9.03</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>20</td>
<td>370</td>
<td>4.41</td>
<td>377</td>
<td>4.33</td>
<td>366</td>
<td>4.46</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>20</td>
<td>187</td>
<td>7.57</td>
<td>185</td>
<td>7.65</td>
<td>183</td>
<td>7.74</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>20</td>
<td>190</td>
<td>9.26</td>
<td>190</td>
<td>9.26</td>
<td>191</td>
<td>9.23</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>20</td>
<td>339</td>
<td>4.23</td>
<td>339</td>
<td>4.23</td>
<td>339</td>
<td>4.23</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>20</td>
<td>485</td>
<td>3.51</td>
<td>484</td>
<td>3.53</td>
<td>484</td>
<td>3.52</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>20</td>
<td>274</td>
<td>10.7</td>
<td>274</td>
<td>10.7</td>
<td>274</td>
<td>10.7</td>
</tr>
<tr>
<td>657.zlib_s</td>
<td>20</td>
<td>373</td>
<td>16.6</td>
<td>373</td>
<td>16.6</td>
<td>372</td>
<td>16.6</td>
</tr>
</tbody>
</table>

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
Yes: 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 7.4, and the system compiler gcc 4.8.5
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
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-3phy Wed Dec  5 16:03:56 2018

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 4114 CPU @ 2.20GHz
  2 "physical id"s (chips)
  20 "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 : 10
siblings : 10
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 1
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
Stepping: 4
Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4114, 2.20GHz)

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Dec-2018

**Hardware Availability:** May-2018

**Software Availability:** Apr-2018

---

**SPECspeed2017_int_base = 7.00**

**SPECspeed2017_int_peak = Not Run**

---

**Platform Notes (Continued)**

```
CPU MHz:               2194.853
BogoMIPS:              4389.70
Virtualization:        VT-x
L1d cache:             32K  
L1i cache:             32K  
L2 cache:              1024K
L3 cache:              14080K
NUMA node0 CPU(s):     0,2,4,6,8,10,12,14,16,18
NUMA node1 CPU(s):     1,3,5,7,9,11,13,15,17,19
Flags:                 fpu vme de pse tsc msr pae mca cmov
                      pat pse36 cm5 flush dtsc vs xsm xprot vxmark vmx smx est tm2 ssse3 sdbg
                      fma cx16 xtpr pdcm pcid dca ssse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
                      xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
                      dtherm intel_pt rdrr_pref stibp retpoline kaiser tpr_shadow vnmi
                      flexpriority ept vpid fsgsbase tsc_adjust bm1 hle avx2 smep bmi1 bmi2  erts invpcid rtm
                      cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
                      xsaveopt xsaec xgetbvl qm_llc qm_occu_llc pku ospke
```

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
node 0 size: 95349 MB
node 0 free: 94942 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19
node 1 size: 96747 MB
node 1 free: 96240 MB
node distances:
  node 0 1
  0: 10 21
  1: 21 10
```

From `/proc/meminfo`

```
MemTotal:       196707336 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

/usr/bin/lsb_release -d

```
SUSE Linux Enterprise Server 12 SP3
```

From `/etc/*release* /etc/*version*`

```
SuSE-release:
```

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4114, 2.20GHz)

SPECspeed2017_int_base = 7.00

SPECspeed2017_int_peak = Not Run

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

Platform Notes (Continued)

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3

# 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.

NAME="SLES"
VERSION="12-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
Linux linux-3phy 4.4.126-94.22-default #1 SMP Wed Apr 11 07:45:03 UTC 2018 (9649989)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Dec 5 15:59 last=5

SPEC is set to: /home/cpu2017

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.

BIOS Dell Inc. 1.4.8 05/22/2018
Memory:
12x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666, configured at 2400
4x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

(Continued on next page)
Dell Inc. 

PowerEdge R540 (Intel Xeon Silver 4114, 2.20GHz) 

SPECspeed2017_int_base = 7.00
SPECspeed2017_int_peak = Not Run

Compiler Version Notes (Continued)

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
641.leela_s(base)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 648.exchange2_s(base)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

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
Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4114, 2.20GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**Base Optimization Flags**

C benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -qopenmp -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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

Fortran benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

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:

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2017 v1.0.5 on 2018-12-05 17:03:55-0500.
Report generated on 2018-12-26 13:02:18 by CPU2017 PDF formatter v6067.
Originally published on 2018-12-25.