SPEC® CPU2017 Integer Rate Result

Dell Inc.
PowerEdge R740xd (Intel Xeon Silver 4109T, 2.00 GHz)

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

Hardware
CPU Name: Intel Xeon Silver 4109T
Max MHz.: 3000
Nominal: 2000
Enabled: 16 cores, 2 chips, 2 threads/core
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: 11 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
Storage: 460 GB SATA SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 12 SP2
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux;
Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel: No
Firmware: version 1.1.7 released Oct-2017
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
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

SPECrate2017_int_base = 70.5
SPECrate2017_int_peak = Not Run

Test Date: Nov-2017
Hardware Availability: Sep-2017
Software Availability: Sep-2017
## Dell Inc.
PowerEdge R740xd (Intel Xeon Silver 4109T, 2.00 GHz)

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>957</td>
<td>53.3</td>
<td>947</td>
<td>53.8</td>
<td>952</td>
<td>53.5</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>717</td>
<td>63.2</td>
<td>709</td>
<td>63.9</td>
<td>700</td>
<td>64.7</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>579</td>
<td>89.3</td>
<td>586</td>
<td>88.2</td>
<td>582</td>
<td>88.9</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>883</td>
<td>47.5</td>
<td>889</td>
<td>47.3</td>
<td>891</td>
<td>47.1</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>466</td>
<td>72.5</td>
<td>481</td>
<td>70.3</td>
<td>477</td>
<td>70.8</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>427</td>
<td>131</td>
<td>421</td>
<td>133</td>
<td>423</td>
<td>133</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>599</td>
<td>61.2</td>
<td>600</td>
<td>61.1</td>
<td>599</td>
<td>61.2</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>964</td>
<td>55.0</td>
<td>979</td>
<td>54.1</td>
<td>969</td>
<td>54.7</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>650</td>
<td>129</td>
<td>650</td>
<td>129</td>
<td>651</td>
<td>129</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>664</td>
<td>52.0</td>
<td>659</td>
<td>52.4</td>
<td>660</td>
<td>52.4</td>
</tr>
</tbody>
</table>

### General Notes

Environment variables set by runcpu before the start of the run:
```
LD_LIBRARY_PATH = "/home/temi/cpu2017/lib/ia32:/home/temi/cpu2017/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/temi/cpu2017/je5.0.1-32:/home/temi/cpu2017/je5.0.1-64"
```

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
Filesyste 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>
```
## SPEC CPU2017 Integer Rate Result

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

### Platform Notes (Continued)

- 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 enabled
- CPU Interconnect Bus Link Power Management disabled
- PCI ASPM L1 Link Power Management disabled
- Sysinfo program /home/temi/cpu2017/bin/sysinfo
- Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
- running on linux-bgfp Fri Nov 17 11:56:41 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
```plaintext
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:
```plaintext
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:           1995.300
BogoMIPS:          3990.60
```

(Continued on next page)
Dell Inc.

PowerEdge R740xd (Intel Xeon Silver 4109T, 2.00 GHz)

**SPEC CPU2017 Integer Rate Result**

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Nov-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Sep-2017</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Sep-2017</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base = 70.5**

**SPECrate2017_int_peak = Not Run**

---

### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Virtualization:</th>
<th>VT-x</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L1i cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L2 cache:</td>
<td>1024K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>11264K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperffmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrm pdcm 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 vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ets invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vld xsaveopt xsavec xgetbv1 cqm_llc cqm_occu_llc</td>
</tr>
</tbody>
</table>

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: 192920 MB |
| node 0 free: 192242 MB |
| node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 |
| node 1 size: 193504 MB |
| node 1 free: 192859 MB |
| node distances: |
| node 0 1 |
| 0: 10 21 |
| 1: 21 10 |

From `/proc/meminfo`

| MemTotal: 395699192 kB |
| HugesPages_Total: 0 |
| Hugespagesize: 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 |

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Dell Inc.
PowerEdge R740xd (Intel Xeon Silver 4109T, 2.00 GHz)

SPECrate2017_int_base = 70.5
SPECrate2017_int_peak = Not Run

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

Test Date: Nov-2017
Hardware Availability: Sep-2017
Software Availability: Sep-2017

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.

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"

uname -a:
Linux linux-bgfp 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 17 11:40

SPEC is set to: /home/temi/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 405G 32G 374G 8% /home

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. 1.1.7 08/10/2017
Memory:
22x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666, configured at 2400
2x 00CE0632000C M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
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)
==============================================================================

(Continued on next page)
Dell Inc.
PowerEdge R740xd (Intel Xeon Silver 4109T, 2.00 GHz)

SPECrate2017_int_base = 70.5
SPECrate2017_int_peak = Not Run

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

Compiler Version Notes (Continued)

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
-----------------------------------------------
FC 548.exchange2_r(base)
-----------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
-----------------------------------------------

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

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

**Dell Inc.**  
PowerEdge R740xd (Intel Xeon Silver 4109T, 2.00 GHz)  

<table>
<thead>
<tr>
<th>SPECrate2017_int_base = 70.5</th>
<th>SPECrate2017_int_peak = Not Run</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Nov-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Sep-2017</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Sep-2017</td>
</tr>
</tbody>
</table>

### 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:


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 v1.0.2 on 2017-11-17 12:56:40-0500.  
Originally published on 2017-12-26.