**SPEC® CPU2017 Integer Rate Result**

**Dell Inc.**  
PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)  

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.8</td>
<td>97.3</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Feb-2018  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>40</td>
<td>72.5</td>
<td>84.4</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>40</td>
<td>80.9</td>
<td>96.1</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>40</td>
<td>60.7</td>
<td>94.4</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>40</td>
<td>56.1</td>
<td>115</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>40</td>
<td>94.4</td>
<td>116</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>40</td>
<td>60.7</td>
<td>184</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>40</td>
<td>81.0</td>
<td>188</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>40</td>
<td>74.5</td>
<td>175</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>40</td>
<td>63.0</td>
<td>175</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>40</td>
<td>62.7</td>
<td>62.7</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Silver 4114  
  - **Max MHz.:** 3000  
  - **Nominal:** 2200  
  - **Enabled:** 20 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:** 13.75 MB I+D on chip per core  
  - **Other:** None  
  - **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
  - **Storage:** 1 TB SATA 7200 RPM  
  - **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64)  
  - **4.4.114-94.11-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  
  - **Compiler for Linux:**  
- **Parallel:** No  
- **Firmware:** Version 1.3.7 released Feb-2018  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator library, version 5.0.1
Dell Inc.

PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)

SPECratenet2017_int_base = 92.8
SPECratenet2017_int_peak = 97.3

Results Table

<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>
<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>40</td>
<td>878</td>
<td>72.5</td>
<td>878</td>
<td>72.5</td>
<td>889</td>
<td>71.6</td>
<td>40</td>
<td>727</td>
<td>87.5</td>
<td>729</td>
<td>87.4</td>
<td>731</td>
<td>87.1</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>40</td>
<td>690</td>
<td>82.1</td>
<td>700</td>
<td>80.9</td>
<td>704</td>
<td>80.5</td>
<td>40</td>
<td>589</td>
<td>96.2</td>
<td>589</td>
<td>96.1</td>
<td>590</td>
<td>95.9</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>40</td>
<td>552</td>
<td>117</td>
<td>570</td>
<td>113</td>
<td>564</td>
<td>115</td>
<td>40</td>
<td>573</td>
<td>113</td>
<td>578</td>
<td>112</td>
<td>576</td>
<td>112</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>40</td>
<td>865</td>
<td>60.7</td>
<td>859</td>
<td>61.1</td>
<td>874</td>
<td>60.0</td>
<td>40</td>
<td>936</td>
<td>56.1</td>
<td>928</td>
<td>56.6</td>
<td>941</td>
<td>55.8</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>40</td>
<td>444</td>
<td>95.2</td>
<td>448</td>
<td>94.3</td>
<td>447</td>
<td>94.4</td>
<td>40</td>
<td>365</td>
<td>116</td>
<td>365</td>
<td>116</td>
<td>365</td>
<td>116</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>40</td>
<td>382</td>
<td>183</td>
<td>379</td>
<td>185</td>
<td>380</td>
<td>184</td>
<td>40</td>
<td>374</td>
<td>187</td>
<td>373</td>
<td>188</td>
<td>372</td>
<td>188</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>40</td>
<td>559</td>
<td>82.0</td>
<td>566</td>
<td>81.0</td>
<td>568</td>
<td>80.8</td>
<td>40</td>
<td>575</td>
<td>79.8</td>
<td>571</td>
<td>80.3</td>
<td>576</td>
<td>79.6</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>40</td>
<td>890</td>
<td>74.4</td>
<td>888</td>
<td>74.6</td>
<td>889</td>
<td>74.5</td>
<td>40</td>
<td>877</td>
<td>75.5</td>
<td>875</td>
<td>75.7</td>
<td>878</td>
<td>75.5</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>40</td>
<td>599</td>
<td>175</td>
<td>600</td>
<td>175</td>
<td>598</td>
<td>175</td>
<td>40</td>
<td>599</td>
<td>175</td>
<td>599</td>
<td>175</td>
<td>598</td>
<td>175</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>40</td>
<td>679</td>
<td>63.6</td>
<td>686</td>
<td>63.0</td>
<td>686</td>
<td>63.0</td>
<td>40</td>
<td>689</td>
<td>62.7</td>
<td>689</td>
<td>62.7</td>
<td>689</td>
<td>62.7</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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:
LD_LIBRARY_PATH = "\root\cpu2017\lib\ia32:\root\cpu2017\lib\intel64:\root\cpu2017\je5.0.1-32:\root\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
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.
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
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
Dell Inc.  
PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)  

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Dell Inc.  
2.20 GHz)

SPECrate2017_int_base = 92.8  
SPECrate2017_int_peak = 97.3

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

Test Date: Feb-2018  
Hardware Availability: Sep-2017  
Software Availability: Sep-2017

General Notes (Continued)

sync; echo 3> /proc/sys/vm/drop_caches  
runcpu command invoked through numaclt i.e.; 
numactl --interleave=all runcpu <etc>

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
C1EE 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 /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568d54c135fd618bccc091c0f
running on linux-5j67 Fri Feb 16 20:13:45 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)
  40 "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 : 20
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): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10

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

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>92.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>97.3</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Feb-2018  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

#### Platform Notes (Continued)

- **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  
- **CPU MHz:** 2194.950  
- **BogoMIPS:** 4389.90  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 14080K  
- **NUMA node0 CPU(s):** 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38  
- **NUMA node1 CPU(s):** 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39  
- **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 rdtscp 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 xtrunc 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 invpcid_single pln pts dtherm intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaveprec qgetbv1 cmp_l1c cmp_occup_l1c 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 20 22 24 26 28 30 32 34 36 38 |
| node 0 size: 95353 MB |
| node 0 free: 94973 MB |
| node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 |
| node 1 size: 96748 MB |
| node 1 free: 96394 MB |

From /proc/meminfo

| MemTotal: 196712160 kB |
| HugePages_Total: 0 |

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)

SPECrate2017_int_base = 92.8
SPECrate2017_int_peak = 97.3

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

Platform Notes (Continued)

Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
   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.
os-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-5j67 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 14 19:46

SPEC is set to: /root/cpu2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sda2 xfs 928G 25G 903G 3% /

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. 1.3.7 02/09/2018
   Memory:
   12x 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400
   4x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
   CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
     525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================
   icc (ICC) 18.0.0 20170811

(Continued on next page)
## Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

<table>
<thead>
<tr>
<th>Compiler</th>
<th>Version</th>
<th>Build Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>icc (ICC)</td>
<td>18.0.0</td>
<td>20170811</td>
</tr>
<tr>
<td>icpc (ICC)</td>
<td>18.0.0</td>
<td>20170811</td>
</tr>
<tr>
<td>icpc (ICC)</td>
<td>18.0.0</td>
<td>20170811</td>
</tr>
<tr>
<td>ifort (IFORT)</td>
<td>18.0.0</td>
<td>20170811</td>
</tr>
</tbody>
</table>

---

## Base Compiler Invocation

### C benchmarks:
- icc

### C++ benchmarks:
- icpc

### Fortran benchmarks:
- ifort
## Dell Inc. PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)

### SPEC CPU2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Rate Peak</th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_base</td>
<td>92.8</td>
<td></td>
</tr>
<tr>
<td>SPECrate2017_int_peak</td>
<td>97.3</td>
<td></td>
</tr>
</tbody>
</table>

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

**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`
SPEC CPU2017 Integer Rate Result

Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)

SPECrate2017_int_base = 92.8
SPECrate2017_int_peak = 97.3

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

Test Date: Feb-2018
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Peak Compiler Invocation

C benchmarks:
icc
C++ benchmarks:
icpc
Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

502.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/i386
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

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

525.x264_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -fno-alias

(Continued on next page)
Peak Optimization Flags (Continued)

525.x264_r (continued):
- L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
- xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
- L/usr/local/je5.0.1-64/lib -ljemalloc

523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
- Wl,-z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
- xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
- L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

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

Peak Other Flags

C benchmarks (except as noted below):
- m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
- m64

523.xalancbmk_r: -m32

Fortran benchmarks:
- m64

The flags files that were used to format this result can be browsed at
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4114, 2.20 GHz)  SPECrate2017_int_base = 92.8
SPECrate2017_int_peak = 97.3

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.
Test Date: Feb-2018
Hardware Availability: Sep-2017
Software Availability: Sep-2017

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 2018-02-16 21:13:44-0500.
Report generated on 2018-10-31 17:07:12 by CPU2017 PDF formatter v6067.
Originally published on 2018-03-20.