



SPEC® CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017_int_base = 120

PowerEdge FC640 (Intel Xeon Gold 5118, 2.30 GHz)

SPECrate2017_int_peak = Not Run

CPU2017 License: 55

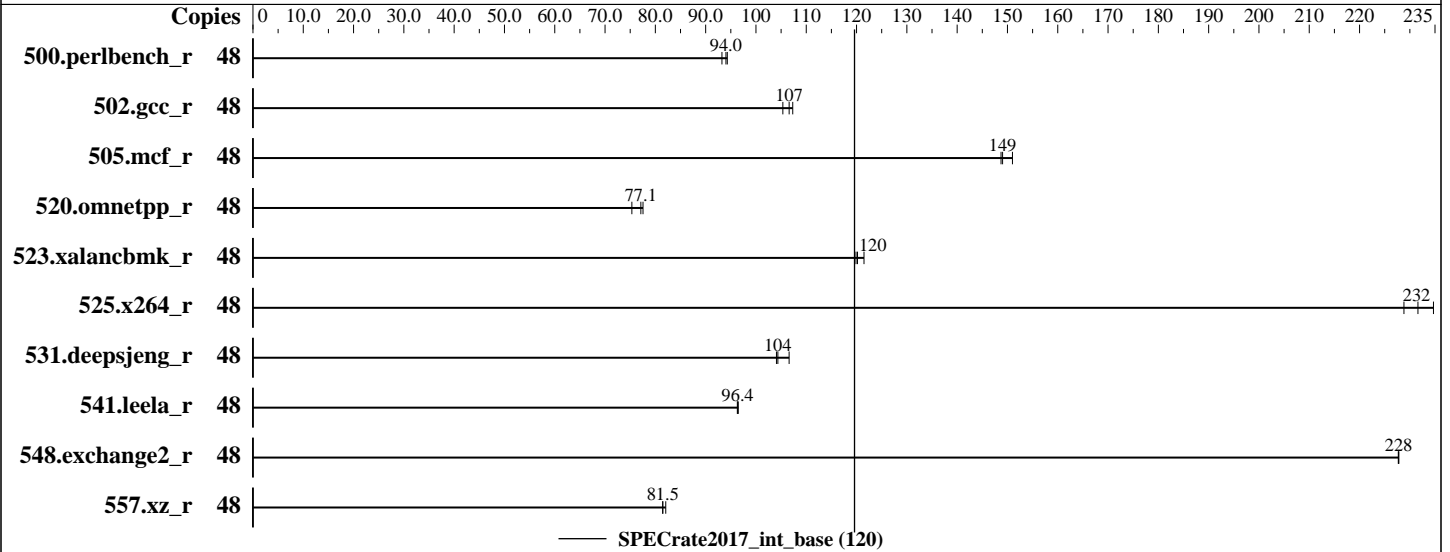
Test Date: Nov-2017

Test Sponsor: Dell Inc.

Hardware Availability: Sep-2017

Tested by: Dell Inc.

Software Availability: Sep-2017



Hardware

CPU Name: Intel Xeon Gold 5118
 Max MHz.: 3200
 Nominal: 2300
 Enabled: 24 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: 16.5 MB I+D on chip per chip
 Other: None
 Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
 Storage: 960 GB SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.16-56-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 1.1.3 released Sep-2017
 File System: btrfs
 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;



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Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|-----------------|--------|------------|-------------|------------|------------|------------|-------------|--------|---------|-------|---------|-------|---------|-------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 500.perlbench_r | 48 | 810 | 94.3 | 820 | 93.2 | 813 | 94.0 | | | | | | | |
| 502.gcc_r | 48 | 633 | 107 | 638 | 107 | 645 | 105 | | | | | | | |
| 505.mcf_r | 48 | 514 | 151 | 522 | 149 | 520 | 149 | | | | | | | |
| 520.omnetpp_r | 48 | 817 | 77.1 | 812 | 77.5 | 836 | 75.3 | | | | | | | |
| 523.xalancbmk_r | 48 | 417 | 121 | 422 | 120 | 423 | 120 | | | | | | | |
| 525.x264_r | 48 | 367 | 229 | 358 | 235 | 363 | 232 | | | | | | | |
| 531.deepsjeng_r | 48 | 516 | 107 | 527 | 104 | 529 | 104 | | | | | | | |
| 541.leela_r | 48 | 824 | 96.5 | 825 | 96.3 | 825 | 96.4 | | | | | | | |
| 548.exchange2_r | 48 | 552 | 228 | 552 | 228 | 552 | 228 | | | | | | | |
| 557.xz_r | 48 | 632 | 82.1 | 636 | 81.5 | 636 | 81.5 | | | | | | | |

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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

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>
```

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;

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General Notes (Continued)

jemalloc: sources available via jemalloc.net

- No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
- No: 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.
- No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, <http://www.spec.org/osg/policy.html>

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Platform Notes

BIOS settings:
 Virtualization Technology disabled
 System Profile set to Custom
 CPU Power Management set to Maximum Performance
 Memory Frequency set to Maximum Performance
 Turbo Boost enabled
 C States disabled
 Memory Patrol Scrub disabled
 PCI ASPM L1 Link Power Management disabled
 Sysinfo program /root/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-u8yg Mon Nov 6 05:40:45 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) Gold 5118 CPU @ 2.30GHz
 2 "physical id"s (chips)
48 "processors"
```

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Platform Notes (Continued)

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 : 12
siblings  : 24
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                48
On-line CPU(s) list:   0-47
Thread(s) per core:    2
Core(s) per socket:    12
Socket(s):             2
NUMA node(s):         4
Vendor ID:             GenuineIntel
CPU family:            6
Model:                85
Model name:            Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz
Stepping:              4
CPU MHz:               2300.105
BogoMIPS:              4600.21
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              16896K
NUMA node0 CPU(s):    0,4,8,12,16,20,24,28,32,36,40,44
NUMA node1 CPU(s):    1,5,9,13,17,21,25,29,33,37,41,45
NUMA node2 CPU(s):    2,6,10,14,18,22,26,30,34,38,42,46
NUMA node3 CPU(s):    3,7,11,15,19,23,27,31,35,39,43,47
```

```
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
aperfmpperf eagerfpu 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 ida arat epb pln pts dtherm intel_pt
tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc
```

```
/proc/cpuinfo cache data
cache size : 16896 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a

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Platform Notes (Continued)

```

physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44
node 0 size: 46971 MB
node 0 free: 46643 MB
node 1 cpus: 1 5 9 13 17 21 25 29 33 37 41 45
node 1 size: 48369 MB
node 1 free: 48134 MB
node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46
node 2 size: 48369 MB
node 2 free: 48134 MB
node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47
node 3 size: 48366 MB
node 3 free: 48117 MB
node distances:
node  0  1  2  3
  0:  10  21  11  21
  1:  21  10  21  11
  2:  11  21  10  21
  3:  21  11  21  10

```

```

From /proc/meminfo
MemTotal:      196687100 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # 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-u8yg 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016 (5b281a8) x86_64
x86_64 x86_64 GNU/Linux

```

run-level 3 Nov 6 05:40

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Platform Notes (Continued)

SPEC is set to: /root/cpu2017

| Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
|------------|-------|------|------|-------|------|------------|
| /dev/sda1 | btrfs | 921G | 35G | 885G | 4% | / |

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. 1.1.3 09/21/2017

Memory:

3x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666, configured at 2400
 9x 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

```
=====
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)
-----
```

```
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.
-----
```



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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:

```
-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
```



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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

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revD.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revD.xml>

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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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