



# SPEC® CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge MX840c (Intel Xeon Gold 6134, 3.20GHz)

SPECrate2017\_int\_base = 214

SPECrate2017\_int\_peak = 224

CPU2017 License: 55

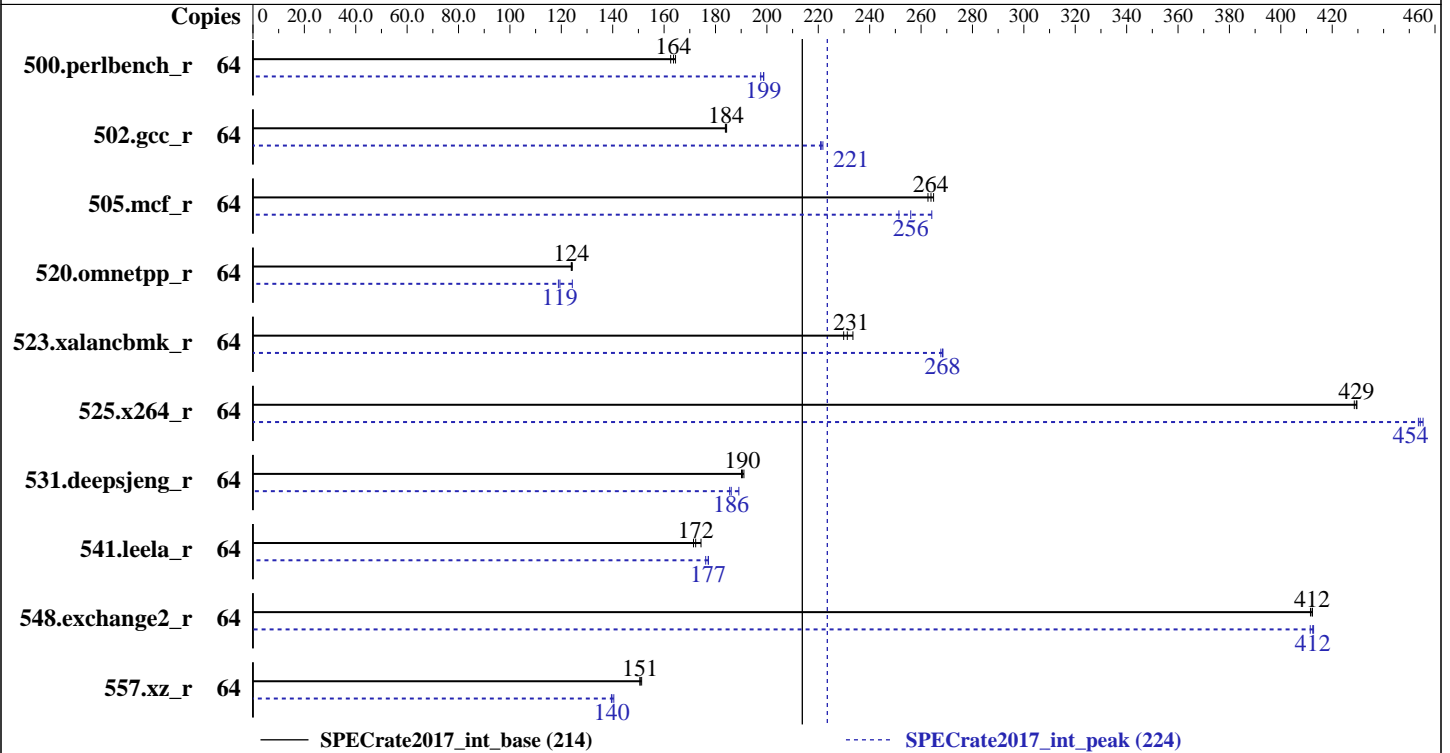
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2018

Hardware Availability: Sep-2018

Software Availability: Feb-2018



### Hardware

CPU Name: Intel Xeon Gold 6134  
 Max MHz.: 3700  
 Nominal: 3200  
 Enabled: 32 cores, 4 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: 24.75 MB I+D on chip per chip  
 Other: None  
 Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)  
 Storage: 960 GB SAS SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 SP3  
 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 0.3.12 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



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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	64	620	164	627	163	<b>622</b>	<b>164</b>	64	513	199	<b>513</b>	<b>199</b>	516	198
502.gcc_r	64	492	184	493	184	<b>492</b>	<b>184</b>	64	409	222	410	221	<b>410</b>	<b>221</b>
505.mcf_r	64	390	265	<b>392</b>	<b>264</b>	394	263	64	392	264	<b>404</b>	<b>256</b>	411	251
520.omnetpp_r	64	678	124	<b>678</b>	<b>124</b>	676	124	64	676	124	706	119	<b>703</b>	<b>119</b>
523.xalancbmk_r	64	<b>292</b>	<b>231</b>	289	233	294	230	64	252	269	<b>252</b>	<b>268</b>	252	268
525.x264_r	64	261	430	<b>261</b>	<b>429</b>	261	429	64	<b>247</b>	<b>454</b>	246	455	247	454
531.deepsjeng_r	64	384	191	<b>385</b>	<b>190</b>	386	190	64	388	189	<b>394</b>	<b>186</b>	395	186
541.leela_r	64	<b>615</b>	<b>172</b>	608	174	618	171	64	<b>598</b>	<b>177</b>	598	177	602	176
548.exchange2_r	64	407	412	<b>407</b>	<b>412</b>	407	412	64	408	411	406	413	<b>407</b>	<b>412</b>
557.xz_r	64	459	151	<b>459</b>	<b>151</b>	457	151	64	492	140	<b>495</b>	<b>140</b>	496	139

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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

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: sources available via jemalloc.net

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
```

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## General Notes (Continued)

runcpu command invoked through numactl 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

ClEE 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 96c45e4568ad54c135fd618bcc091c0f

running on linux-5y3r Tue Mar 13 07:57:28 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) Gold 6134 CPU @ 3.20GHz

4 "physical id"s (chips)

64 "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 2 3 9 16 19 26 27

physical 1: cores 0 3 5 16 19 20 21 22

physical 2: cores 0 2 3 9 16 19 26 27

physical 3: cores 0 2 3 9 16 19 26 27

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 64

On-line CPU(s) list: 0-63

Thread(s) per core: 2

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## Platform Notes (Continued)

```

Core(s) per socket:      8
Socket(s):               4
NUMA node(s):           8
Vendor ID:               GenuineIntel
CPU family:              6
Model:                   85
Model name:              Intel(R) Xeon(R) Gold 6134 CPU @ 3.20GHz
Stepping:                4
CPU MHz:                 3192.646
BogoMIPS:                6385.29
Virtualization:         VT-x
L1d cache:               32K
L1i cache:               32K
L2 cache:                1024K
L3 cache:                25344K
NUMA node0 CPU(s):      0, 8, 16, 24, 32, 40, 48, 56
NUMA node1 CPU(s):      1, 9, 17, 25, 33, 41, 49, 57
NUMA node2 CPU(s):      2, 10, 18, 26, 34, 42, 50, 58
NUMA node3 CPU(s):      3, 11, 19, 27, 35, 43, 51, 59
NUMA node4 CPU(s):      4, 12, 20, 28, 36, 44, 52, 60
NUMA node5 CPU(s):      5, 13, 21, 29, 37, 45, 53, 61
NUMA node6 CPU(s):      6, 14, 22, 30, 38, 46, 54, 62
NUMA node7 CPU(s):      7, 15, 23, 31, 39, 47, 55, 63
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 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 erms invpcid rtm cqm mpx
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

```

```

/proc/cpuinfo cache data
cache size : 25344 KB

```

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

```

available: 8 nodes (0-7)
node 0 cpus: 0 8 16 24 32 40 48 56
node 0 size: 95365 MB
node 0 free: 95058 MB
node 1 cpus: 1 9 17 25 33 41 49 57
node 1 size: 96763 MB
node 1 free: 96622 MB
node 2 cpus: 2 10 18 26 34 42 50 58

```

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## Platform Notes (Continued)

```

node 2 size: 96763 MB
node 2 free: 96576 MB
node 3 cpus: 3 11 19 27 35 43 51 59
node 3 size: 96763 MB
node 3 free: 96611 MB
node 4 cpus: 4 12 20 28 36 44 52 60
node 4 size: 96763 MB
node 4 free: 96583 MB
node 5 cpus: 5 13 21 29 37 45 53 61
node 5 size: 96763 MB
node 5 free: 96553 MB
node 6 cpus: 6 14 22 30 38 46 54 62
node 6 size: 96763 MB
node 6 free: 96631 MB
node 7 cpus: 7 15 23 31 39 47 55 63
node 7 size: 96760 MB
node 7 free: 96618 MB
node distances:
node  0  1  2  3  4  5  6  7
 0: 10 21 21 21 11 21 21 21
 1: 21 10 21 21 21 11 21 21
 2: 21 21 10 21 21 21 11 21
 3: 21 21 21 10 21 21 21 11
 4: 11 21 21 21 10 21 21 21
 5: 21 11 21 21 21 10 21 21
 6: 21 21 11 21 21 21 10 21
 7: 21 21 21 11 21 21 21 10

```

From /proc/meminfo

MemTotal: 791250224 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:

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"

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## Platform Notes (Continued)

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-5y3r 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 Mar 13 07:56

SPEC is set to: /root/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	xfs	882G	16G	866G	2%	/

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. 0.3.12 02/06/2018

Memory:

```
12x 00AD00B300AD HMA84GR7AFR4N-VK 32 GB 2 rank 2666
12x 00AD063200AD HMA84GR7AFR4N-VK 32 GB 2 rank 2666
24x 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  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
-----
```

```
=====  
CC 500.perlbench_r(peak) 502.gcc_r(peak)  
-----
```

```
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)  
-----
```

(Continued on next page)



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## Compiler Version Notes (Continued)

541.leela\_r(base)

-----  
icpc (ICC) 18.0.0 20170811

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

=====  
CXXC 520.omnetpp\_r(peak) 523.xalancbmk\_r(peak) 531.deepsjeng\_r(peak)  
541.leela\_r(peak)

-----  
icpc (ICC) 18.0.0 20170811

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

=====  
FC 548.exchange2\_r(base, peak)

-----  
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

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## Base Portability Flags (Continued)

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

## Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort





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## 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: -w1,-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/ia32
-w1,-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: -w1,-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: -w1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -fno-alias
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
557.xz_r: Same as 505.mcf_r
```

C++ benchmarks:

```
520.omnetpp_r: -w1,-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
-w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
```

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## Peak Optimization Flags (Continued)

523.xalancbmk\_r (continued):

`-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

<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-revC.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-revC.xml>

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