



# SPEC® CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C480 M5 (Intel Xeon Gold 6134M, 3.20 GHz)

SPECrate2017\_int\_base = 218

SPECrate2017\_int\_peak = 232

CPU2017 License: 9019

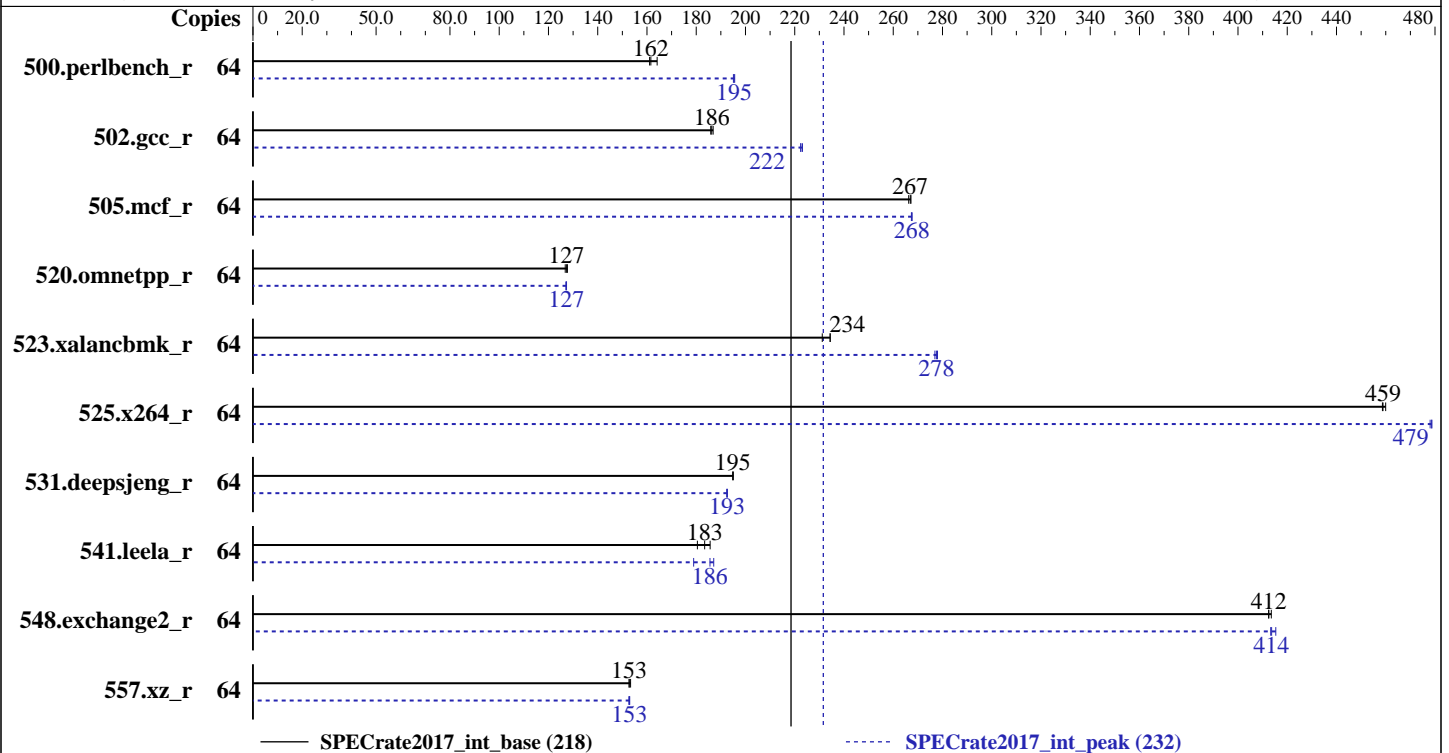
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Jan-2019

Hardware Availability: Aug-2017

Software Availability: Oct-2018



### Hardware

CPU Name: Intel Xeon Gold 6134M  
 Max MHz.: 3700  
 Nominal: 3200  
 Enabled: 32 cores, 4 chips, 2 threads/core  
 Orderable: 2,4 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: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)  
 Storage: 1 x 1 TB HDD, 7.2K RPM  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 SP2 (x86\_64) 4.4.120-92.70-default  
 Compiler: C/C++: Version 19.0.0.117 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 19.0.0.117 of Intel Fortran Compiler for Linux  
 Parallel: No  
 Firmware: Version 3.1.3e released Jun-2018  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: jemalloc memory allocator 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	64	621	164	633	161	<b>631</b>	<b>162</b>	64	521	196	522	195	<b>522</b>	<b>195</b>
502.gcc_r	64	<b>486</b>	<b>186</b>	485	187	488	186	64	406	223	407	222	<b>407</b>	<b>222</b>
505.mcf_r	64	387	267	388	266	<b>387</b>	<b>267</b>	64	386	268	<b>387</b>	<b>268</b>	387	267
520.omnetpp_r	64	662	127	658	128	<b>659</b>	<b>127</b>	64	<b>660</b>	<b>127</b>	661	127	659	127
523.xalancbmk_r	64	<b>288</b>	<b>234</b>	292	231	288	234	64	244	277	243	278	<b>244</b>	<b>278</b>
525.x264_r	64	244	459	244	460	<b>244</b>	<b>459</b>	64	234	478	<b>234</b>	<b>479</b>	234	479
531.deepsjeng_r	64	376	195	<b>376</b>	<b>195</b>	376	195	64	381	192	<b>381</b>	<b>193</b>	381	193
541.leela_r	64	<b>578</b>	<b>183</b>	571	186	587	180	64	566	187	592	179	<b>571</b>	<b>186</b>
548.exchange2_r	64	407	412	<b>407</b>	<b>412</b>	405	414	64	<b>405</b>	<b>414</b>	406	413	404	415
557.xz_r	64	451	153	453	153	<b>452</b>	<b>153</b>	64	<b>452</b>	<b>153</b>	452	153	453	153

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

## Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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 = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM  
memory using Redhat Enterprise Linux 7.5  
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

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.

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### General Notes (Continued)

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 from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

### Platform Notes

BIOS Settings:  
Intel HyperThreading Technology set to Enabled  
CPU performance set to Enterprise  
Power Performance Tuning set to OS Controls  
SNC set to Enabled  
IMC Interleaving set to 1-way Interleave  
Patrol Scrub set to Disabled  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-9r4j Thu Jan 3 13:10:28 2019

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 6134M 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 2 3 9 16 19 26 27  
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  
Core(s) per socket: 8

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### Platform Notes (Continued)

```

Socket(s): 4
NUMA node(s): 8
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6134M CPU @ 3.20GHz
Stepping: 4
CPU MHz: 3699.999
CPU max MHz: 3700.0000
CPU min MHz: 1200.0000
BogoMIPS: 6393.13
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0,1,3,4,32,33,35,36
NUMA node1 CPU(s): 2,5-7,34,37-39
NUMA node2 CPU(s): 8,9,11,12,40,41,43,44
NUMA node3 CPU(s): 10,13-15,42,45-47
NUMA node4 CPU(s): 16,17,19,20,48,49,51,52
NUMA node5 CPU(s): 18,21-23,50,53-55
NUMA node6 CPU(s): 24,25,27,28,56,57,59,60
NUMA node7 CPU(s): 26,29-31,58,61-63
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 fl6c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm hwp hwp_act_window hwp_epp hwp_pkg_req intel_pt rsb_ctxsw spec_ctrl stibp
retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bml 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 : 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 1 3 4 32 33 35 36
node 0 size: 192094 MB
node 0 free: 191896 MB
node 1 cpus: 2 5 6 7 34 37 38 39
node 1 size: 193528 MB
node 1 free: 193239 MB

```

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### Platform Notes (Continued)

```

node 2 cpus: 8 9 11 12 40 41 43 44
node 2 size: 193528 MB
node 2 free: 193376 MB
node 3 cpus: 10 13 14 15 42 45 46 47
node 3 size: 193528 MB
node 3 free: 193400 MB
node 4 cpus: 16 17 19 20 48 49 51 52
node 4 size: 193528 MB
node 4 free: 193421 MB
node 5 cpus: 18 21 22 23 50 53 54 55
node 5 size: 193528 MB
node 5 free: 193387 MB
node 6 cpus: 24 25 27 28 56 57 59 60
node 6 size: 193528 MB
node 6 free: 193423 MB
node 7 cpus: 26 29 30 31 58 61 62 63
node 7 size: 193525 MB
node 7 free: 193413 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10  11  21  21  21  21  21  21
1:  11  10  21  21  21  21  21  21
2:  21  21  10  11  21  21  21  21
3:  21  21  11  10  21  21  21  21
4:  21  21  21  21  10  11  21  21
5:  21  21  21  21  11  10  21  21
6:  21  21  21  21  21  21  10  11
7:  21  21  21  21  21  21  11  10

```

From /proc/meminfo

MemTotal: 1583913440 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"

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### Platform Notes (Continued)

```
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"
```

```
uname -a:
Linux linux-9r4j 4.4.120-92.70-default #1 SMP Wed Mar 14 15:59:43 UTC 2018 (52a83de)
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 Jan 3 12:54
```

```
SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda1       xfs   930G   35G  896G   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 Cisco Systems, Inc. C480M5.3.1.3e.0.0613181101 06/13/2018

Memory:  
48x 0xCE00 M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

### Compiler Version Notes

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

```
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version  
19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----
```

```
=====  
CC 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)  
525.x264_r(base, peak) 557.xz_r(base, peak)  
-----
```

```
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

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### Compiler Version Notes (Continued)

=====  
CC 500.perlbench\_r(peak)  
-----

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----

=====  
CXXC 523.xalanbmk\_r(peak)  
-----

Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version  
19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----

=====  
CXXC 520.omnetpp\_r(base) 523.xalanbmk\_r(base) 531.deepsjeng\_r(base)  
541.leela\_r(base)  
-----

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----

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

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----

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

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----



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## Base Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

## 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-AVX512 -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-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 -align array32byte
```

```
-L/usr/local/je5.0.1-64/lib -ljemalloc
```





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## Peak Compiler Invocation

C benchmarks (except as noted below):

```
icc -m64 -std=c11
```

```
502.gcc_r: icc -m32 -std=c11 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.0.117/linux/compiler/lib/ia32_lin
```

C++ benchmarks (except as noted below):

```
icpc -m64
```

```
523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.0.117/linux/compiler/lib/ia32_lin
```

Fortran benchmarks:

```
ifort -m64
```

## 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-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib  
-ljemalloc
```

```
502.gcc_r: -w1, -z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -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-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib  
-ljemalloc
```

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## Peak Optimization Flags (Continued)

```
525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -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: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -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-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic19.0-official-linux64.2019-01-15.html>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic19.0-official-linux64.2019-01-15.xml>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.xml>

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Tested with SPEC CPU2017 v1.0.5 on 2019-01-03 13:10:27-0500.

Report generated on 2019-03-05 15:56:21 by CPU2017 PDF formatter v6067.

Originally published on 2019-03-05.