SPEC® CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)
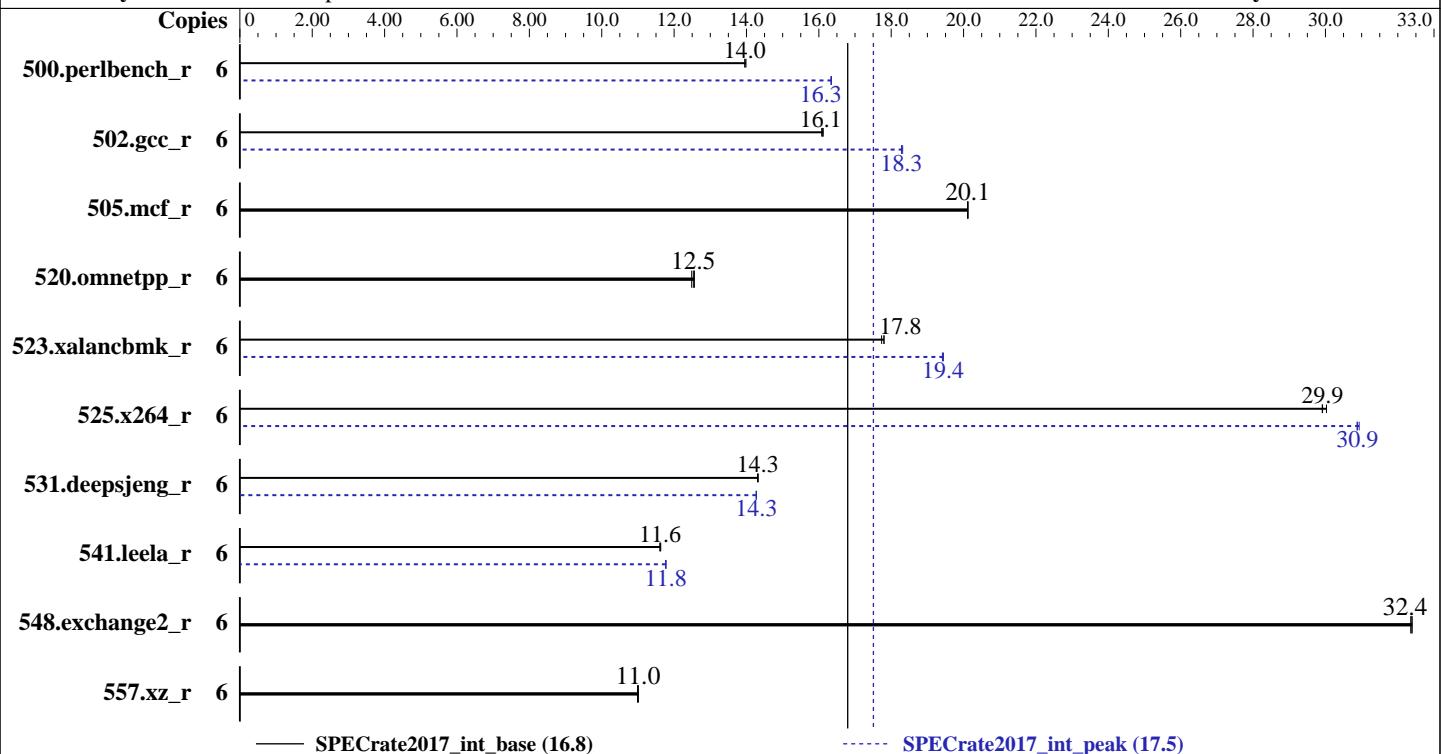
SPECrate2017_int_base = 16.8

SPECrate2017_int_peak = 17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

Copies	
500.perlbench_r	6	14.0 / 16.3
502.gcc_r	6	16.1 / 18.3
505.mcf_r	6	20.1
520.omnetpp_r	6	12.5
523.xalancbmk_r	6	17.8 / 19.4
525.x264_r	6	29.9 / 30.9
531.deepsjeng_r	6	14.3 / 14.3
541.leela_r	6	11.6 / 11.8
548.exchange2_r	6	32.4
557.xz_r	6	11.0

— **SPECrate2017_int_base (16.8)**   ---- **SPECrate2017_int_peak (17.5)**

Hardware

CPU Name: Intel Xeon Bronze 3104
 Max MHz.: 1700
 Nominal: 1700
Enabled: 6 cores, 1 chip
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:   8.25 MB I+D on chip per chip
 Other: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2133)
Storage: 1 x 1 TB SATA, 7200 RPM, RAID 0
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)
                Kernel 3.10.0-693.21.1.el7.x86_64
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux;
                Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux
Parallel: No
Firmware: NEC BIOS Version U30 02/15/2018 released Mar-2018
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	6	683	14.0	684	14.0	**684**	**14.0**	6	585	16.3	**585**	**16.3**	584	16.3
502.gcc_r	6	527	16.1	**528**	**16.1**	528	16.1	6	464	18.3	465	18.3	**465**	**18.3**
505.mcf_r	6	482	20.1	482	20.1	**482**	**20.1**	6	482	20.1	482	20.1	**482**	**20.1**
520.omnetpp_r	6	630	12.5	**628**	**12.5**	627	12.6	6	630	12.5	**628**	**12.5**	627	12.6
523.xalancbmk_r	6	357	17.7	356	17.8	**356**	**17.8**	6	**326**	**19.4**	326	19.4	326	19.4
525.x264_r	6	**351**	**29.9**	350	30.0	351	29.9	6	340	30.9	340	30.9	**340**	**30.9**
531.deepsjeng_r	6	480	14.3	**480**	**14.3**	481	14.3	6	**482**	**14.3**	482	14.3	482	14.3
541.leela_r	6	854	11.6	**855**	**11.6**	856	11.6	6	844	11.8	**844**	**11.8**	844	11.8
548.exchange2_r	6	**486**	**32.4**	486	32.4	485	32.4	6	**486**	**32.4**	486	32.4	485	32.4
557.xz_r	6	**589**	**11.0**	588	11.0	590	11.0	6	**589**	**11.0**	588	11.0	590	11.0

SPECrate2017_int_base =   **16.8**

SPECrate2017_int_peak =   **17.5**

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:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-6700K 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.

(Continued on next page)

SPEC CPU2017 Integer Rate Result

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

General Notes (Continued)

```
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS Settings:
 Thermal Configuration: Maximum Cooling
 Workload Profile: General Throughput Compute
 Memory Patrol Scrubbing: Disabled
 LLC Dead Line Allocation: Disabled
 LLC Prefetch: Enabled
 Workload Profile: Custom
 Sub-NUMA Clustering: Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on r120h2m Mon Nov 19 11:14:05 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) Bronze 3104 CPU @ 1.70GHz
      1  "physical id"s (chips)
      6 "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 : 6
      siblings  : 6
      physical 0: cores 0 1 2 3 4 5

From lscpu:
    Architecture:          x86_64
    CPU op-mode(s):        32-bit, 64-bit
    Byte Order:            Little Endian
    CPU(s):                6
    On-line CPU(s) list:   0-5
    Thread(s) per core:    1
    Core(s) per socket:    6
    Socket(s):             1
    NUMA node(s):          1
    Vendor ID:             GenuineIntel
    CPU family:            6
    Model:                 85
```

(Continued on next page)

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

CPU2017 License: 9006　　　　　　　　　　　　　　　　　　**Test Date:**　　Nov-2018
Test Sponsor:　NEC Corporation　　　　　　　　　　**Hardware Availability:** Aug-2017
Tested by:　　　NEC Corporation　　　　　　　　　　**Software Availability:**　Mar-2018

Platform Notes (Continued)

```
        Model name:             Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz
        Stepping:               4
        CPU MHz:                1700.000
        BogoMIPS:               3400.00
        Virtualization:         VT-x
        L1d cache:              32K
        L1i cache:              32K
        L2 cache:               1024K
        L3 cache:               8448K
        NUMA node0 CPU(s):      0-5
        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 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 epb cat_l3 cdp_l3 invpcid_single
    intel_pt spec_ctrl ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase
    tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq
    rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1
    cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm arat pln pts

  /proc/cpuinfo cache data
     cache size : 8448 KB

  From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0 1 2 3 4 5
    node 0 size: 196268 MB
    node 0 free: 191522 MB
    node distances:
    node   0
      0:  10

  From /proc/meminfo
     MemTotal:       197753048 kB
     HugePages_Total:        0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.4 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VARIANT="Server"
        VARIANT_ID="server"
```

(Continued on next page)

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

Platform Notes (Continued)

```
     VERSION_ID="7.4"
     PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
  redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
  Linux r120h2m 3.10.0-693.21.1.el7.x86_64 #1 SMP Fri Feb 23 18:54:16 UTC 2018 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: Load fences
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Nov 19 11:08

SPEC is set to: /home/cpu2017
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda3       ext4  909G  384G  479G  45% /

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 NEC U30 02/15/2018
  Memory:
   12x UNKNOWN NOT AVAILABLE
   12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666, configured at 2133

(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) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


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

SPEC CPU2017 Integer Rate Result

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

Compiler Version Notes (Continued)

```
------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------


========================================================================
 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------


========================================================================
 CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
      541.leela_r(peak)
------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------


========================================================================
  FC  548.exchange2_r(base)
------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------


========================================================================
  FC  548.exchange2_r(peak)
------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

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

Peak Compiler Invocation

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

502.gcc_r: icc -m32 -std=c11 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

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

523.xalancbmk_r: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base =   16.8

SPECrate2017_int_peak =   17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

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-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: `-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`

 505.mcf_r: basepeak = yes

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

 557.xz_r: basepeak = yes

C++ benchmarks:

 520.omnetpp_r: basepeak = yes

 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: `-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`

(Continued on next page)

NEC Corporation

Express5800/R120h-2M (Intel Xeon Bronze 3104)

SPECrate2017_int_base = 16.8

SPECrate2017_int_peak = 17.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

Test Date: Nov-2018
Hardware Availability: Aug-2017
Software Availability: Mar-2018

Peak Optimization Flags (Continued)

541.leela_r: Same as 531.deepsjeng_r

Fortran benchmarks:

548.exchange2_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html
http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevB.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2018-11-18 21:14:04-0500.
Report generated on 2018-12-11 14:53:36 by CPU2017 PDF formatter v6067.
Originally published on 2018-12-11.