



SPEC® CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

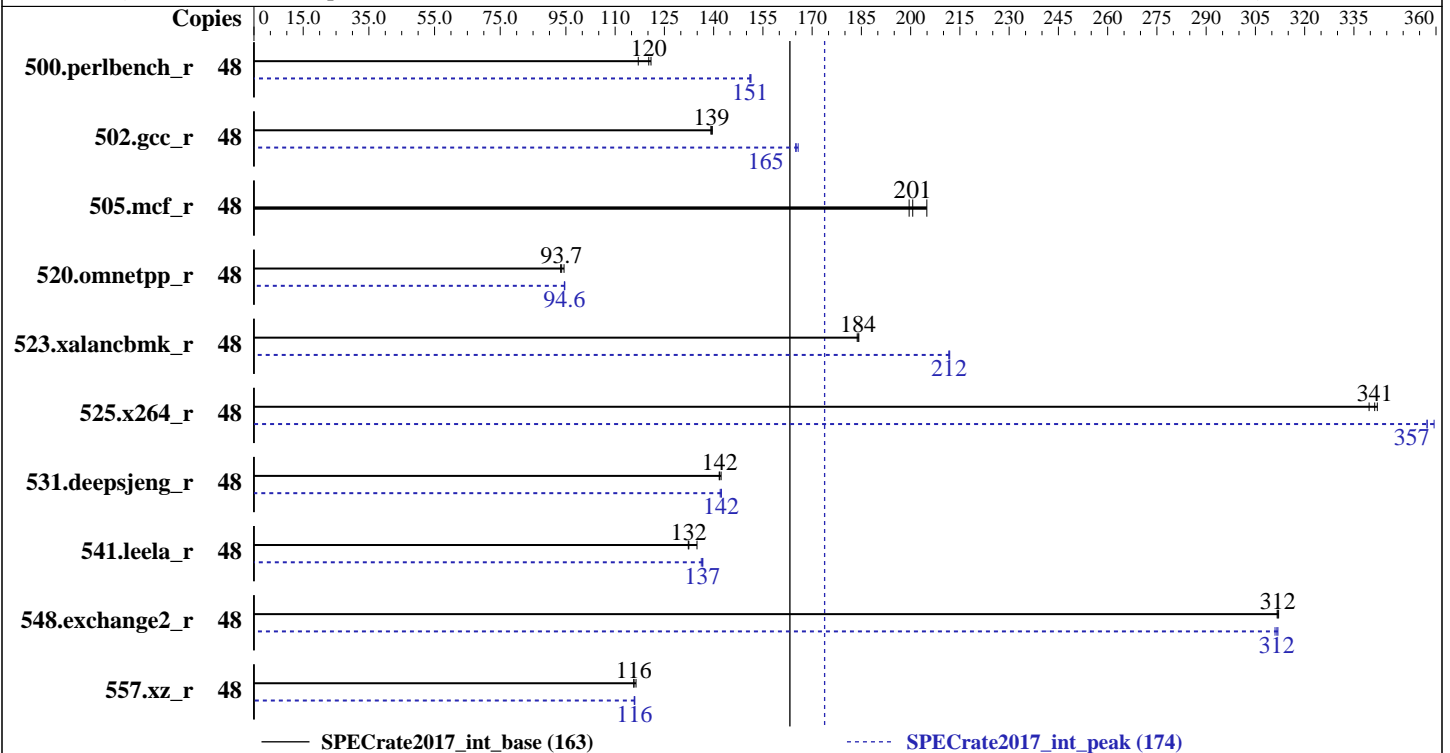
Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018



Hardware

CPU Name: Intel Xeon Gold 6128
Max MHz.: 3700
Nominal: 3400
Enabled: 24 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: 19.25 MB I+D on chip per chip
Other: None
Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 800 GB tmpfs
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP3 (x86_64)
kernel 4.4.120-94.17-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: NEC BIOS Version 5.7.0123 08/07/2018 released Sep-2018
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator library V5.0.1



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	48	632	121	636	120	653	117	48	506	151	506	151	505	151
502.gcc_r	48	488	139	487	140	488	139	48	410	166	412	165	412	165
505.mcf_r	48	387	201	389	200	379	205	48	387	201	389	200	379	205
520.omnetpp_r	48	672	93.7	667	94.4	674	93.4	48	666	94.5	665	94.7	666	94.6
523.xalancbmk_r	48	275	184	276	184	275	184	48	239	212	239	212	239	212
525.x264_r	48	246	341	247	340	246	342	48	235	357	234	359	235	357
531.deepsjeng_r	48	388	142	387	142	388	142	48	386	142	387	142	387	142
541.leela_r	48	589	135	600	132	601	132	48	583	136	581	137	582	137
548.exchange2_r	48	403	312	403	312	404	312	48	404	311	404	312	403	312
557.xz_r	48	446	116	448	116	448	116	48	448	116	447	116	447	116

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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"
Tmpfs filesystem can be set with:
mount -t tmpfs -o size=800g tmpfs /home
cpupower -c all frequency-set -g performance
VM Dirty ratio was set to 40 using "echo 40 > /proc/sys/vm/dirty_ratio"
Set Kernel Boot Parameter : nohz_full=1-223
irqbalance disabled with "service irqbalance stop"
echo 0 > /proc/sys/kernel/numa_balancing
```

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/SPEC/lib/ia32:/home/SPEC/lib/intel64:/home/SPEC/je5.0.1-32:/home/SPEC/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.:

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

General Notes (Continued)

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

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.

Platform Notes

BIOS Settings:

Memory RAS Mode: SDDC mode
VT-x : Disabled
Processor C6 Report : Disabled
OS Performance Tuning : Disabled
Energy Performance : Performance
Patrol Scrub : Disabled
DCU Streamer Prefetcher : Disabled
Memory P.E. Retry : Disabled
Sub NUMA Clustering : Enabled
Dead Line LLC Allocation : Disabled
Sysinfo program /home/SPEC/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-o0zp Tue Jan 8 18:16:40 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 6128 CPU @ 3.40GHz
 4 "physical id"s (chips)
 48 "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 : 12
physical 0: cores 0 6 9 10 11 13
physical 1: cores 0 6 9 10 11 13
physical 2: cores 0 6 9 10 11 13
physical 3: cores 0 6 9 10 11 13
```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Platform Notes (Continued)

```

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:    6
Socket(s):              4
NUMA node(s):          8
Vendor ID:              GenuineIntel
CPU family:             6
Model:                  85
Model name:             Intel(R) Xeon(R) Gold 6128 CPU @ 3.40GHz
Stepping:               4
CPU MHz:                3401.000
CPU max MHz:            3401.0000
CPU min MHz:            1200.0000
BogoMIPS:               6783.78
Virtualization:         VT-x
L1d cache:              32K
L1i cache:              32K
L2 cache:               1024K
L3 cache:               19712K
NUMA node0 CPU(s):     0,2,3,24,26,27
NUMA node1 CPU(s):     1,4,5,25,28,29
NUMA node2 CPU(s):     6,8,9,30,32,33
NUMA node3 CPU(s):     7,10,11,31,34,35
NUMA node4 CPU(s):     12,14,15,36,38,39
NUMA node5 CPU(s):     13,16,17,37,40,41
NUMA node6 CPU(s):     18,20,21,42,44,45
NUMA node7 CPU(s):     19,22,23,43,46,47
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 invpcid_single pln pts
dtherm 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 pku ospke

```

```

/proc/cpuinfo cache data
cache size : 19712 KB

```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Platform Notes (Continued)

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 2 3 24 26 27
node 0 size: 192007 MB
node 0 free: 191134 MB
node 1 cpus: 1 4 5 25 28 29
node 1 size: 193534 MB
node 1 free: 192913 MB
node 2 cpus: 6 8 9 30 32 33
node 2 size: 193534 MB
node 2 free: 193231 MB
node 3 cpus: 7 10 11 31 34 35
node 3 size: 193534 MB
node 3 free: 192893 MB
node 4 cpus: 12 14 15 36 38 39
node 4 size: 193534 MB
node 4 free: 191430 MB
node 5 cpus: 13 16 17 37 40 41
node 5 size: 193534 MB
node 5 free: 189016 MB
node 6 cpus: 18 20 21 42 44 45
node 6 size: 193534 MB
node 6 free: 192476 MB
node 7 cpus: 19 22 23 43 46 47
node 7 size: 193407 MB
node 7 free: 193242 MB
node distances:
node   0   1   2   3   4   5   6   7
  0:  10  11  15  15  15  15  15  15
  1:  11  10  15  15  15  15  15  15
  2:  15  15  10  11  15  15  15  15
  3:  15  15  11  10  15  15  15  15
  4:  15  15  15  15  10  11  15  15
  5:  15  15  15  15  11  10  15  15
  6:  15  15  15  15  15  15  10  11
  7:  15  15  15  15  15  15  11  10

```

```

From /proc/meminfo
MemTotal:      1583743404 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP3

```

From /etc/*release* /etc/*version*

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Platform Notes (Continued)

```

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-o0zp 4.4.120-94.17-default #1 SMP Wed Mar 14 17:23:00 UTC 2018 (cf3a7bb)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 8 18:01

SPEC is set to: /home/SPEC
Filesystem      Type      Size  Used Avail Use% Mounted on
tmpfs           tmpfs    800G   9.1G  791G   2% /home

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 American Megatrends Inc. 5.7.0123 08/07/2018
  Memory:
    48x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(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.
=====

```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Compiler Version Notes (Continued)

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)
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

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Base Portability Flags (Continued)

```
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
```

Base Other Flags

C benchmarks:

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

C++ benchmarks:

```
-m64
```

Fortran benchmarks:

```
-m64
```

Peak Compiler Invocation

C benchmarks:

```
icc
```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Peak Compiler Invocation (Continued)

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-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: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-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 -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -fno-alias
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

(Continued on next page)



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

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

Test Date: Jan-2019
Hardware Availability: Sep-2019
Software Availability: Mar-2018

Peak Optimization Flags (Continued)

```
557.xz_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
```

C++ benchmarks:

```
520.omnetpp_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/je5.0.1-64/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-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:

```
-w1, -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
```

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/NEC-Platform-Settings-SPECcpu2017-Flags-V1.2-SKL-A2040e-RevE.html>



SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/A2040e
(3.40 GHz, Intel Xeon Gold 6128)

SPECrate2017_int_base = 163

SPECrate2017_int_peak = 174

CPU2017 License: 9006

Test Sponsor: NEC Corporation

Tested by: NEC Corporation

Test Date: Jan-2019

Hardware Availability: Sep-2019

Software Availability: Mar-2018

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/NEC-Platform-Settings-SPECcpu2017-Flags-V1.2-SKL-A2040e-RevE.xml>

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 2019-01-08 04:16:39-0500.

Report generated on 2019-08-06 17:56:31 by CPU2017 PDF formatter v6067.

Originally published on 2019-08-06.