### NEC Corporation

#### SPEC CPU®2017 Integer Rate Result

**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation  
**Test Date:** Sep-2020  
**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

<table>
<thead>
<tr>
<th>Software</th>
<th>SPECrate®2017_int_base = 119</th>
<th>SPECrate®2017_int_peak = 124</th>
</tr>
</thead>
</table>
| OS:      | Red Hat Enterprise Linux Server release 7.7 (Maipo)  
Kernel 3.10.0-1062.1.1.el7.x86_64 |  
Compiler: | C/C++: Version 19.0.4.227 of Intel C/C++  
Compiler Build 20190416 for Linux;  
Fortran: Version 19.0.4.227 of Intel Fortran  
Compiler Build 20190416 for Linux |  
Parallel: | No |  
Firmware: | NEC BIOS Version U32 v2.32 03/09/2020 released Jun-2020 |  
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 |  
Power Management: | BIOS set to prefer performance at the cost of additional power usage. |  

### Hardware

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<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base (119)</th>
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<td>87.7 100 100 100</td>
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<tr>
<td>502.gcc_r</td>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
<td>81.2 81.5 112 157 157</td>
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### CPU2017 License:

- 9006

**Test Sponsor:** NEC Corporation

**Tested by:** NEC Corporation

**Test Date:** Sep-2020

**Hardware Availability:** Dec-2019

**Software Availability:** Sep-2019

**CPU Name:** Intel Xeon Gold 5215M

- **Max MHz:** 3400
- **Nominal:** 2500
- **Enabled:** 20 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 13.75 MB I+D on chip per chip
- **Other:** None

**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)

**Storage:** 1 x 1 TB SATA, 7200 RPM, RAID 0

**Other:** None

**OS:**
- Red Hat Enterprise Linux Server release 7.7 (Maipo)
- Kernel 3.10.0-1062.1.1.el7.x86_64

**Compiler:**
- C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux;
- Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux

**Parallel:** No

**Firmware:**
- NEC BIOS Version U32 v2.32 03/09/2020 released Jun-2020

**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

**Power Management:** BIOS set to prefer performance at the cost of additional power usage.
NEC Corporation

Express5800/R120h-1M (Intel Xeon Gold 5215M)

**SPEC CPU®2017 Integer Rate Result**

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**SPECrate®2017_int_base = 119**

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Results Table

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<td>554</td>
<td>78.0</td>
<td>555</td>
<td>77.9</td>
</tr>
</tbody>
</table>

**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"

**Environment Variables Notes**

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
```

**General Notes**

Binaries compiled on a system with 1x Intel Core i9-7900X 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
```

runcpu command invoked through numactl i.e.:

```
numactl --interleave=all runcpu <etc>
```

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

NEC Corporation

Express5800/R120h-1M (Intel Xeon Gold 5215M)

SPECrate®2017_int_base = 119
SPECrate®2017_int_peak = 124

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

Test Date: Sep-2020
Hardware Availability: Dec-2019
Software Availability: Sep-2019

General Notes (Continued)

NA: 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.

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:
Thermal Configuration: Maximum Cooling
Workload Profile: General Throughput Compute
Memory Patrol Scrubbing: Disabled
LLC Dead Line Allocation: Disabled
LLC Prefetch: Enabled
Enhanced Processor Performance: Enabled
Workload Profile: Custom
   Advanced Memory Protection: Advanced ECC Support
   Sub-NUMA Clustering: Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7eddb1e6e46a485a0011
running on r120h1m Fri Sep 18 18:10:17 2020

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

(Continued on next page)
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Test Date: Sep-2020
Hardware Availability: Dec-2019
Software Availability: Sep-2019

Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Gold 5215M CPU @ 2.50GHz
  2 "physical id"s (chips)
  40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5215M CPU @ 2.50GHz
Stepping: 6
CPU MHz: 2500.000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmperf 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 ebp cat_13 cd ptpin intel_pt ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw
avx512vl xsaveopt xsavec x Freedom gm_occup_llc gm_mbb_total gm_mbb_local
dtherm ida arat pinn pts pkup ospe avx512_vnni md_clear spec_ctrl intel_stibp

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

## NEC Corporation

**Express5800/R120h-1M (Intel Xeon Gold 5215M)**

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**SPECrate®2017_int_base = 119**

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---

### Platform Notes (Continued)

```
flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size : 14080 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
  available: 2 nodes (0-1)
  node 0 cpus:  0  1  2  3  4  5  6  7  8  9  20  21  22  23  24  25  26  27  28  29
  node 0 size: 196265 MB
  node 0 free: 191639 MB
  node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
  node 1 size: 196607 MB
  node 1 free: 192063 MB
  node distances:
    node 0:  10  21
    node 1:  21  10

From /proc/meminfo
  MemTotal:       395923400 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.7 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.7"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.7 (Maipo)"
  redhat-release: Red Hat Enterprise Linux Server release 7.7 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.7 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.7:ga:server

uname -a:
  Linux r120h1m 3.10.0-1062.1.1.el7.x86_64 #1 SMP Tue Aug 13 18:39:59 UTC 2019 x86_64
  x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

| CVE-2018-3620 (L1 Terminal Fault): | Not affected |
| Microarchitectural Data Sampling:   | Not affected |
| CVE-2017-5754 (Meltdown):          | Not affected |
```

(Continued on next page)
NEC Corporation

Express5800/R120h-1M (Intel Xeon Gold 5215M)

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**Platform Notes (Continued)**

CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp

CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, usercopy/swapps barriers and __user pointer sanitization

CVE-2017-5715 (Spectre variant 2): Mitigation: Full retпольine, IBPB

run-level 3 Sep 18 18:04

SPEC is set to: /home/cpu2017

```
Filesystem   Type  Size  Used Avail Use% Mounted on
/dev/sda3     ext4  908G  188G  675G  22% /
```

From /sys/devices/virtual/dmi/id

- BIOS: NEC U32 03/09/2020
- Vendor: NEC
- Product: Express5800/R120h-1M
- Serial: JPN0084094

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.

Memory:
24x HPE P03050-091 16 GB 2 rank 2933

End of data from sysinfo program

Regarding the sysinfo display about the memory speed, the correct configured memory speed is 2666 MT/s. The dmidecode description should be as follows:
24x HPE P03050-091 16 GB 2 rank 2933, configured at 2666

**Compiler Version Notes**

```
==============================================================================
C       | 502.gcc_r(peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version
19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
```

```
-----------------------------------------------------------------------------
C | 500.perlbench_r(base, peak) 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 19.0.4.227 Build 20190416
```

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Express5800/R120h-1M (Intel Xeon Gold 5215M)  

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**Compiler Version Notes (Continued)**

Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

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| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416 |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

| C++ | 523.xalancbmk_r(peak) |
| Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416 |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

| C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416 |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

| C++ | 523.xalancbmk_r(peak) |
| Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416 |
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| C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) |
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Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
Fortran | 548.exchange2_r(base, peak)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

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.xalancmk_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.zx_r -DSPEC_LP64
## Base Optimization Flags

**C benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout=trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
- `-lqkmalloc`

**C++ benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout=trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
- `-lqkmalloc`

**Fortran benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout=trans=4`
- `-nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
- `-lqkmalloc`

## Peak Compiler Invocation

**C benchmarks (except as noted below):**
```bash
icc -m64 -std=c11
```
- `502.gcc_r.icc -m32 -std=c11 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin`

**C++ benchmarks (except as noted below):**
```bash
icpc -m64
```
- `523.xalancbmk_r.icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin`

**Fortran benchmarks:**
```bash
ifort -m64
```

## Peak Portability Flags

```bash
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
```
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**NEC Corporation**  
Express5800/R120h-1M (Intel Xeon Gold 5215M)

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**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

### Peak Portability Flags (Continued)

- `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=4 -fno-strict-overflow -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc`
- `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=4 -L/usr/local/je5.0.1-32/lib -ljemalloc`
- `557.xz_r`: Same as `505.mcf_r`

#### C++ benchmarks:

- `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=4 -L/usr/local/je5.0.1-32/lib -ljemalloc`
- `531.deepsjeng_r`: `basepeak = yes`

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

## NEC Corporation

**Express5800/R120h-1M (Intel Xeon Gold 5215M)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>119</th>
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<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>124</td>
</tr>
</tbody>
</table>

### CPU2017 License: 9006

**Test Date:** Sep-2020  
**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation

## Peak Optimization Flags (Continued)

541.leela_r: basepeak = yes

Fortran benchmarks:
- W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
- qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte  
- L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64  
- lqkmalloc

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


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


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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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