NEC Corporation

Express5800/R120h-2M (Intel Xeon Gold 5115)

SPECrate2017_int_base = 102
SPECrate2017_int_peak = 108

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)</td>
<td>CPU Name: Intel Xeon Gold 5115</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 18.0.2.199 of Intel C/C++</td>
<td>Max MHz.: 3200</td>
</tr>
<tr>
<td>Compiler for Linux: Fortran: Version 18.0.2.199 of Intel Fortran</td>
<td>Nominal: 2400</td>
</tr>
<tr>
<td>Firmware: NEC BIOS Version U30 02/15/2018 released Mar-2018</td>
<td>Enabled: 20 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>File System: ext4</td>
<td>Orderable: 1,2 chips</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>L2: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>L3: 13.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
<td>Other: None</td>
</tr>
</tbody>
</table>

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Test Date: Aug-2018
Hardware Availability: Jun-2018
Software Availability: Mar-2018

Hardware

500.perlbench_r 40
502.gcc_r 40
505.mcf_r 40
520.omnetpp_r 40
523.xalancbmk_r 40
525.x264_r 40
531.deepsjeng_r 40
541.leela_r 40
548.exchange2_r 40
557.xz_r 40

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r 40</td>
<td>78.3</td>
<td>94.7</td>
</tr>
<tr>
<td>502.gcc_r 40</td>
<td>87.6</td>
<td>104</td>
</tr>
<tr>
<td>505.mcf_r 40</td>
<td>104</td>
<td>127</td>
</tr>
<tr>
<td>520.omnetpp_r 40</td>
<td>67.2</td>
<td>102</td>
</tr>
<tr>
<td>523.xalancbmk_r 40</td>
<td>126</td>
<td>195</td>
</tr>
<tr>
<td>525.x264_r 40</td>
<td>89.2</td>
<td>196</td>
</tr>
<tr>
<td>531.deepsjeng_r 40</td>
<td>83.7</td>
<td>195</td>
</tr>
<tr>
<td>541.leela_r 40</td>
<td>85.1</td>
<td>196</td>
</tr>
<tr>
<td>548.exchange2_r 40</td>
<td>69.5</td>
<td>196</td>
</tr>
<tr>
<td>557.xz_r 40</td>
<td>196</td>
<td>196</td>
</tr>
</tbody>
</table>
## NEC Corporation

**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

**Operating System Notes**

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>
```

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)

(Continued on next page)
## SPEC CPU2017 Integer Rate Result

### NEC Corporation

**Express5800/R120h-2M (Intel Xeon Gold 5115)**  

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License</td>
<td>9006</td>
</tr>
<tr>
<td>Test Sponsor</td>
<td>NEC Corporation</td>
</tr>
<tr>
<td>Tested by</td>
<td>NEC Corporation</td>
</tr>
<tr>
<td>SPECrate2017_int_base</td>
<td>102</td>
</tr>
<tr>
<td>SPECrate2017_int_peak</td>
<td>108</td>
</tr>
<tr>
<td>Test Date</td>
<td>Aug-2018</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Jun-2018</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

### General Notes (Continued)

is mitigated in the system as tested and documented.

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  

### 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 Tue Aug 21 09:11:24 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 5115 CPU @ 2.40GHz
- 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

(Continued on next page)
NEC Corporation

Express5800/R120h-2M (Intel Xeon Gold 5115)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECraten2017_int_base = 102
SPECraten2017_int_peak = 108

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

Platform Notes (Continued)

CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5115 CPU @ 2.40GHz
Stepping: 4
CPU MHz: 2400.000
BogoMIPS: 4800.00
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 mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsdp lm constant_tsc art arch_perfmon pebs bts rep_good ntopstop_tsc aperf perfmon 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 ebpx cat_l3 cdp_l3 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vmmi 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 ida arat pln pts

/proc/cpuinfo cache data

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: 97964 MB
node 0 free: 95502 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: 98303 MB
node 1 free: 95901 MB

distance:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo

MemTotal: 197747508 KB
HugePages_Total: 0
Hugepagesize: 2048 KB

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

(Continued on next page)
NEC Corporation

Express5800/R120h-2M (Intel Xeon Gold 5115)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>108</td>
</tr>
</tbody>
</table>

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

Test Date: Aug-2018
Hardware Availability: Jun-2018
Software Availability: Mar-2018

Platform Notes (Continued)

```plaintext
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.4 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VARIANT="Server"
  VARIANT_ID="server"
  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 Aug 21 09:05

SPEC is set to: /home/cpu2017
  Filesystem  Type  Size  Used Avail Use% Mounted on
  /dev/sda3    ext4  909G  394G  469G  46% /

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:
    24x HPE 876319-081 8 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  500.perlibench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
     557.xz_r(base)
==============================================================================
icc (ICC) 18.0.2 20180210

(Continued on next page)
NEC Corporation

Express5800/R120h-2M (Intel Xeon Gold 5115)

SPECRate2017_int_base = 102
SPECRate2017_int_peak = 108

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

Compiler Version Notes (Continued)

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)
==============================================================================
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*
SPEC CPU2017 Integer Rate Result

NEC Corporation
Express5800/R120h-2M (Intel Xeon Gold 5115)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>102</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>108</td>
</tr>
</tbody>
</table>

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

Test Date: Aug-2018
Hardware Availability: Jun-2018
Software Availability: Mar-2018

Base Compiler Invocation (Continued)

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

Peak Compiler Invocation

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

(Continued on next page)
SPEC CPU2017 Integer Rate Result

NEC Corporation
Express5800/R120h-2M (Intel Xeon Gold 5115)

SPECrate2017_int_base = 102
SPECrate2017_int_peak = 108

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

Test Date: Aug-2018
Hardware Availability: Jun-2018
Software Availability: Mar-2018

Peak Compiler Invocation (Continued)

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

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 -03 -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 -03 -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: basepeak = yes
557.xz_r: basepeak = yes

(Continued on next page)
Peak Optimization Flags (Continued)

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: basepeak = yes

541.leela_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

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/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

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.