**SPEC® CPU2017 Integer Rate Result**

**NEC Corporation**

**Express5800/R120h-2M (Intel Xeon Gold 6126)**

<table>
<thead>
<tr>
<th>Spec Test</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_intPeak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int. Rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>139</td>
<td>148</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9006

**Test Sponsor:** NEC Corporation

**Test Date:** Jun-2018

**Hardware Availability:** Jun-2018

**Tested by:** NEC Corporation

**Software Availability:** Mar-2018

---

**CPU Name:** Intel Xeon Gold 6126

**Max MHz.:** 3700

**Nominal:** 2600

**Enabled:** 24 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:** 19.25 MB I+D on chip per chip

**Other:** None

**Memory:** 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R)

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

**Other:** None

---

**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

**NEC Corporation**

Express5800/R120h-2M (Intel Xeon Gold 6126)

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<td>Jun-2018</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base = 139**

**SPECrate2017_int_peak = 148**

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Ratio</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>48</td>
<td>715</td>
<td>107</td>
<td>716</td>
<td>107</td>
<td>717</td>
<td>107</td>
<td>48</td>
<td>587</td>
<td>130</td>
<td>594</td>
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<td>502.gcc_r</td>
<td>48</td>
<td>576</td>
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<td>579</td>
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<td>584</td>
<td>116</td>
<td>48</td>
<td>481</td>
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<td>142</td>
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<tr>
<td>505.mcf_r</td>
<td>48</td>
<td>439</td>
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<td>449</td>
<td>173</td>
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<tr>
<td>520.omnetpp_r</td>
<td>48</td>
<td>721</td>
<td>87.4</td>
<td>722</td>
<td>87.2</td>
<td>738</td>
<td>85.3</td>
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<td>738</td>
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<td>523.xalancbmk_r</td>
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<td>296</td>
<td>284</td>
<td>295</td>
<td>285</td>
<td>301</td>
<td>279</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>48</td>
<td>441</td>
<td>125</td>
<td>454</td>
<td>121</td>
<td>456</td>
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<td>541.leela_r</td>
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<td>119</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>48</td>
<td>464</td>
<td>271</td>
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<td>463</td>
<td>272</td>
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<td>463</td>
<td>272</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>48</td>
<td>540</td>
<td>96.0</td>
<td>552</td>
<td>93.9</td>
<td>553</td>
<td>93.7</td>
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<td>540</td>
<td>96.0</td>
<td>552</td>
<td>93.9</td>
<td>553</td>
<td>93.7</td>
</tr>
</tbody>
</table>

**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"

### 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
```

runcpu command invoked through numactl i.e.:

```
umactl --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) 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 Gold 6126)

**SPECrate2017_int_base = 139**

**SPECrate2017_int_peak = 148**

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<td>NEC Corporation</td>
</tr>
</tbody>
</table>

**Test Date:** Jun-2018

**Hardware Availability:** Jun-2018

**Software Availability:** Mar-2018

**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
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd8f2999c33d61f64985e45859ea9
running on r120h2m Thu Jun 28 19:16:07 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 6126 CPU @ 2.60GHz
  2 "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 : 12
siblings : 24
physical 0: cores 0 1 3 4 5 6 8 9 10 11 12 13
physical 1: cores 0 1 2 4 5 6 8 9 10 11 13 14

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: 12
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85

(Continued on next page)
NEC Corporation

Express5800/R120h-2M (Intel Xeon Gold 6126)

| SPECrate2017_int_base = 139 |
| SPECrate2017_int_peak = 148 |

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

Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Gold 6126 CPU @ 2.60GHz  
Stepping: 4  
CPU MHz: 2600.000  
BogoMIPS: 5200.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 19712K  
NUMA node0 CPU(s): 0-5,24-29  
NUMA node1 CPU(s): 6-11,30-35  
NUMA node2 CPU(s): 12-17,36-41  
NUMA node3 CPU(s): 18-23,42-47  
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 ntop nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xtopr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand rdrand10 lrc0 rdtscp ept vpid fsgsbse tsc_adjust bmis hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512v1 xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts

/proc/cpuinfo cache data  
  cache size : 19712 KB

From numactl --hardware  

WARNING: a numactl 'node' might or might not correspond to a physical chip.  
available: 4 nodes (0-3)  
node 0 cpus: 0 1 2 3 4 5 24 25 26 27 28 29  
node 0 size: 48812 MB  
node 0 free: 47449 MB  
node 1 cpus: 6 7 8 9 10 11 30 31 32 33 34 35  
node 1 size: 49152 MB  
node 1 free: 47889 MB  
node 2 cpus: 12 13 14 15 16 17 36 37 38 39 40 41  
node 2 size: 49152 MB  
node 2 free: 48011 MB  
node 3 cpus: 18 19 20 21 22 23 42 43 44 45 46 47  
node 3 size: 49151 MB  
node 3 free: 48013 MB  
node distances:  
  0: 10 21 31 31  
  1: 21 10 31 31  
  2: 31 31 10 21

(Continued on next page)
Platform Notes (Continued)

3:  31  31  21  10

From /proc/meminfo
  MemTotal:       197745876 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"
    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 Jun 28 19:10

SPEC is set to: /home/cpu2017
  Filesystem Type  Size  Used Avail Use% Mounted on
  /dev/sda3  ext4  909G  330G  533G  39% /

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

(End of data from sysinfo program)
NEC Corporation
Express5800/R120h-2M (Intel Xeon Gold 6126)

SPECrate2017_int_base = 139
SPECrate2017_int_peak = 148

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

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)
==============================================================================
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.
## SPEC CPU2017 Integer Rate Result

### NEC Corporation

**Express5800/R120h-2M (Intel Xeon Gold 6126)**

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<tr>
<td>SPECrate2017_int_peak</td>
<td>148</td>
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**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
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**Test Date:** Jun-2018  
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### Base Compiler Invocation

<table>
<thead>
<tr>
<th>Type</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>C benchmarks</td>
<td><code>icc -m64 -std=c11</code></td>
</tr>
<tr>
<td>C++ benchmarks</td>
<td><code>icpc -m64</code></td>
</tr>
<tr>
<td>Fortran benchmarks</td>
<td><code>ifort -m64</code></td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Flags</th>
</tr>
</thead>
</table>
| 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` |
SPEC CPU2017 Integer Rate Result

NEC Corporation
Express5800/R120h-2M (Intel Xeon Gold 6126)

SPECrate2017_int_base = 139
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CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

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

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

Peak Portability Flags

500.perlbm_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.perlbm_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
SPEC CPU2017 Integer Rate Result

NEC Corporation
Express5800/R120h-2M (Intel Xeon Gold 6126)  SPECrate2017_int_base = 139
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Peak Optimization Flags (Continued)

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: 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-icl18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevB.xml

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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 2018-06-28 06:16:07-0400.