## SPEC® CPU2017 Integer Rate Result

**NEC Corporation**

**Express5800/D120h (Intel Xeon Silver 4114)**

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>June-2018</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>Hardware Availability:</td>
<td>Jan-2018</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

### Copies

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_base</td>
<td>48.1</td>
</tr>
<tr>
<td>SPECrate2017_int_peak</td>
<td>50.7</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name**: Intel Xeon Silver 4114
- **Max MHz.**: 3000
- **Nominal**: 2200
- **Enabled**: 10 cores, 1 chip, 2 threads/core
- **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**: 13.75 MB I+D on chip per chip
- **Memory**: 192 GB (6 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)
- **Storage**: 1 x 1 TB SATA, 7200 RPM
- **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 18.0.0.128 of Intel C/C++ Compiler for Linux;
  Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
- **Parallel**: No
- **Firmware**: Version F21 02/22/2018 released Apr-2018
- **File System**: ext4
- **System State**: Run level 3 (multi-user)
- **Base Pointers**: 64-bit
- **Peak Pointers**: 32/64-bit
- **Other**: jemalloc memory allocator library V5.0.1
NEC Corporation

Express5800/D120h (Intel Xeon Silver 4114)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 48.1
SPECrate2017_int_peak = 50.7

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>20</td>
<td>880</td>
<td>36.2</td>
<td>878</td>
<td>36.3</td>
<td>877</td>
<td>36.3</td>
<td>20</td>
<td>721</td>
<td>44.2</td>
<td>727</td>
<td>43.8</td>
<td>725</td>
<td>43.9</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>20</td>
<td>658</td>
<td>43.0</td>
<td>658</td>
<td>43.0</td>
<td>661</td>
<td>42.9</td>
<td>20</td>
<td>569</td>
<td>49.7</td>
<td>572</td>
<td>49.5</td>
<td>572</td>
<td>49.5</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>20</td>
<td>520</td>
<td>62.2</td>
<td>513</td>
<td>63.0</td>
<td>537</td>
<td>60.1</td>
<td>20</td>
<td>520</td>
<td>62.2</td>
<td>513</td>
<td>63.0</td>
<td>537</td>
<td>60.1</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>20</td>
<td>838</td>
<td>31.3</td>
<td>837</td>
<td>31.3</td>
<td>835</td>
<td>31.4</td>
<td>20</td>
<td>838</td>
<td>31.3</td>
<td>837</td>
<td>31.3</td>
<td>835</td>
<td>31.4</td>
</tr>
<tr>
<td>523.xalanbmk_r</td>
<td>20</td>
<td>412</td>
<td>51.2</td>
<td>415</td>
<td>50.9</td>
<td>413</td>
<td>51.1</td>
<td>20</td>
<td>355</td>
<td>59.5</td>
<td>356</td>
<td>59.4</td>
<td>355</td>
<td>59.5</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>20</td>
<td>384</td>
<td>91.3</td>
<td>387</td>
<td>90.5</td>
<td>386</td>
<td>90.7</td>
<td>20</td>
<td>371</td>
<td>94.4</td>
<td>369</td>
<td>94.8</td>
<td>370</td>
<td>94.8</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>20</td>
<td>562</td>
<td>40.8</td>
<td>563</td>
<td>40.7</td>
<td>562</td>
<td>40.8</td>
<td>20</td>
<td>562</td>
<td>40.8</td>
<td>563</td>
<td>40.7</td>
<td>562</td>
<td>40.8</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>20</td>
<td>894</td>
<td>37.1</td>
<td>886</td>
<td>37.4</td>
<td>906</td>
<td>36.6</td>
<td>20</td>
<td>884</td>
<td>37.5</td>
<td>900</td>
<td>36.8</td>
<td>884</td>
<td>37.5</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>20</td>
<td>594</td>
<td>88.2</td>
<td>593</td>
<td>88.4</td>
<td>593</td>
<td>88.3</td>
<td>20</td>
<td>595</td>
<td>88.1</td>
<td>592</td>
<td>88.4</td>
<td>593</td>
<td>88.3</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>20</td>
<td>617</td>
<td>35.0</td>
<td>615</td>
<td>35.1</td>
<td>618</td>
<td>35.0</td>
<td>20</td>
<td>617</td>
<td>35.0</td>
<td>615</td>
<td>35.1</td>
<td>618</td>
<td>35.0</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 48.1
SPECrate2017_int_peak = 50.7

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 i7-4790 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

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;

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)
SPEC CPU2017 Integer Rate Result

NEC Corporation
Express5800/D120h (Intel Xeon Silver 4114)

SPECrate2017_int_base = 48.1
SPECrate2017_int_peak = 50.7

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

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

General Notes (Continued)
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:
ENERGY_PERF_BIAS_CFG mode: Performance
LLC dead line alloc: Disable
Patrol Scrub: Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bdc091c0f
running on d120h Fri Jun 29 08:39:25 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) Silver 4114 CPU @ 2.20GHz
  1 "physical id"s (chips)
  20 "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

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
Stepping: 4
CPU MHz: 1062.101

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

**NEC Corporation**

**Express5800/D120h (Intel Xeon Silver 4114)**

**SPECrate2017_int_base** = 48.1  
**SPECrate2017_int_peak** = 50.7

---

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

**Test Date**:  
**Hardware Availability**: Jan-2018  
**Software Availability**: Mar-2018

---

**Platform Notes (Continued)**

```plaintext
CPU max MHz:           3000.0000
CPU min MHz:           800.0000
BogoMIPS:              4400.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              14080K
NUMA node0 CPU(s):     0-19
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
                       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 cpb cat_l3 invpcid_single
                       intel_pt spec_ctrl ibpb_support tpr_shadow vmx_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 xsave xsetbv1
cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts hwp
                       hwp_act_window hwp_epp hwp_pkg_req

/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: 1 nodes (0)
   node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
   node 0 size: 195236 MB
   node 0 free: 190060 MB
   node distances:
   node 0
   0:  10

From /proc/meminfo
   MemTotal:       196476384 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)
<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERSION_ID=&quot;7.4&quot;</td>
</tr>
<tr>
<td>PRETTY_NAME=&quot;Red Hat Enterprise Linux Server 7.4 (Maipo)&quot;</td>
</tr>
<tr>
<td>redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)</td>
</tr>
<tr>
<td>system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)</td>
</tr>
<tr>
<td>system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server</td>
</tr>
</tbody>
</table>

```
uname -a:
Linux d120h 3.10.0-693.21.1.el7.x86_64 #1 SMP Fri Feb 23 18:54:16 UTC 2018 x86_64
dx86_64 x86_64 GNU/Linux
```

run-level 3 Jun 29 08:33

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>ext4</td>
<td>909G</td>
<td>386G</td>
<td>477G</td>
<td>45%</td>
<td>/</td>
</tr>
</tbody>
</table>

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 GIGABYTE F21 02/22/2018
Memory:
10x NO DIMM NO DIMM
6x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400

(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.

```
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)
```

(Continued on next page)
NEC Corporation
Express5800/D120h (Intel Xeon Silver 4114)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>48.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>50.7</td>
</tr>
</tbody>
</table>

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

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

Compiler Version Notes (Continued)

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
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

(Continued on next page)
SPEC CPU2017 Integer Rate Result

NEC Corporation
Express5800/D120h (Intel Xeon Silver 4114)

| SPECrate2017_int_base = 48.1 |
| SPECrate2017_int_peak = 50.7 |

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

Base Portability Flags (Continued)

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:

Base Other Flags

C benchmarks:
- m64 -std=c11

C++ benchmarks:
- m64

Fortran benchmarks:
- m64

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/D120h (Intel Xeon Silver 4114)

SPECrate2017_int_base = 48.1

SPECrate2017_int_peak = 50.7

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

Test Date: Jun-2018
Hardware Availability: Jan-2018
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: -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

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_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

531.deepsjeng_r: basepeak = yes

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

**NEC Corporation**

**Express5800/D120h (Intel Xeon Silver 4114)**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.1</td>
<td>50.7</td>
</tr>
</tbody>
</table>

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

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

---

**Peak Optimization Flags (Continued)**

```plaintext
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:
-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
```

---

**Peak Other Flags**

**C benchmarks (except as noted below):**

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

**502.gcc_r:**

```plaintext
-m32 -std=c11
```

**C++ benchmarks (except as noted below):**

```plaintext
-m64
```

**523.xalancbmk_r:**

```plaintext
-m32
```

**Fortran benchmarks:**

```plaintext
-m64
```

---

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:


---

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 2018-06-28 19:39:24-0400.  