## SPEC® CPU2017 Floating Point Rate Result

**NEC Corporation**

**Express5800/T110i-S (Intel Xeon E3-1220 v6)**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td><strong>SPECrate2017_fp_base</strong></td>
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<td>26.3</td>
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<th>Nov-2018</th>
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<tr>
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<td>Apr-2017</td>
</tr>
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<td>Software Availability:</td>
<td>Mar-2018</td>
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</table>

### Hardware

- **CPU Name:** Intel Xeon E3-1220 v6
- **Max MHz.:** 3500
- **Nominal:** 3000
- **Enabled:** 4 cores, 1 chip
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 256 KB I+D on chip per core
- **L3:** 8 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2400T-E)
- **Storage:** 1 x 1 TB SATA, 7200 RPM
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)
- **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:** Version 5.0.3006 02/28/2018 released Apr-2018
- **File System:** ext4
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>446</td>
<td>14.3</td>
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</tbody>
</table>

**SPECrate2017_fp_base = 25.8**

**SPECrate2017_fp_peak = 26.3**

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 i7-6700K 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:
  ```bash
  sync; echo 3 > /proc/sys/vm/drop_caches
  ```

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)
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CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation
Test Date: Nov-2018
Hardware Availability: Apr-2017
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:
  Power Management Policy: Custom
  Energy Performance: Performance
  DCU Streamer Prefetcher: Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on t110is Mon Nov 5 17:32:52 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) CPU E3-1220 v6 @ 3.00GHz
  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 : 4
  siblings : 4
  physical 0: cores 0 1 2 3

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 4
  On-line CPU(s) list: 0-3
  Thread(s) per core: 1
  Core(s) per socket: 4
  Socket(s): 1
  NUMA node(s): 1
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 158
  Model name: Intel(R) Xeon(R) CPU E3-1220 v6 @ 3.00GHz
  Stepping: 9
  CPU MHz: 3304.335

(Continued on next page)
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Platform Notes (Continued)

CPU max MHz: 3500.0000
CPU min MHz: 800.0000
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-3
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
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xtpr pdcm pclid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch epb invpcid_single intel_pt spec_ctrl
ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2
smap bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1
dtherm ida arat pin pts hwp hwp_notify hwp_act_window hwp_epp

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
node 0 size: 65474 MB
node 0 free: 63622 MB
node distances:
node 0
0: 10

From /proc/meminfo
MemTotal: 65915028 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)"

(Continued on next page)
Platform Notes (Continued)

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 t110is 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 Nov 5 17:27

SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 ext4 909G 116G 747G 14% /

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. 5.0.3006 02/28/2018
Memory:
    4x Micron 18ASF2G72AZ-2G3B1 16 GB 2 rank 2400

(End of data from sysinfo program)
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Compiler Version Notes (Continued)

==============================================================================
__CXXC 508.namd_r(base) 510.parest_r(base, peak)______________________________
| icpc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
__CXXC 508.namd_r(peak)______________________________
| icpc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
__CC  511.povray_r(base) 526.blender_r(base, peak)______________________________
| icpc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
| icc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
__CC   511.povray_r(peak)______________________________
| icpc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
| icc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
__FC  507.cactuBSSN_r(base, peak)______________________________
| icpc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
| icc (ICC) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
| ifort (IFORT) 18.0.2 20180210
| Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
__FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)______________________________
| ifort (IFORT) 18.0.2 20180210

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FC  554.roms_r(peak)
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icc (ICC) 18.0.2 20180210
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CC  521.wrf_r(peak) 527.cam4_r(peak)
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icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

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Base Compiler Invocation ( Continued )

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactusBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

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#### Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

#### Peak Compiler Invocation

C benchmarks:

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

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:

```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

#### Peak Portability Flags

Same as Base Portability Flags

#### Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

```
538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3
```

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

544.nab_r: Same as 538.imagick_r

C++ benchmarks:
508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -03
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

510.parest_r: -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:
503.bwaves_r: -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -auto
-nostandard-realloc-lhs

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -03
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -03
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:
511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -03
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

526.blender_r: -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
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<thead>
<tr>
<th>NEC Corporation</th>
<th>SPECrate2017_fp_base = 25.8</th>
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<tbody>
<tr>
<td>NEC Corporation</td>
<td>SPECrate2017_fp_peak = 26.3</td>
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</table>

**NEC Corporation**

**NEC Corporation**

**Express5800/T110i-S (Intel Xeon E3-1220 v6)**

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<th>SPEC CPU2017 Floating Point Rate Result</th>
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<tbody>
<tr>
<td>SPEC CPU2017 License: 9006</td>
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<tr>
<td>Test Sponsor: NEC Corporation</td>
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<td>Tested by: NEC Corporation</td>
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<tr>
<td>Test Date: Nov-2018</td>
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<td>Hardware Availability: Apr-2017</td>
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<td>Software Availability: Mar-2018</td>
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You can also download the XML flags sources by saving the following links:


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Tested with SPEC CPU2017 v1.0.5 on 2018-11-05 03:32:51-0500.
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