## NEC Corporation

### SPEC CPU 2017 Floating Point Rate Result

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

---

The table below shows the results of the SPEC CPU 2017 Floating Point Rate test for NEC Corporation's Express5800/T110j-S (Intel Xeon E-2236) in December 2019.

<table>
<thead>
<tr>
<th>SpecMark</th>
<th>Copies</th>
<th>SPECrate 2017_fp_base</th>
<th>SPECrate 2017_fp_peak</th>
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<tbody>
<tr>
<td>503.bwaves_r</td>
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<td>507.cactuBSSN_r</td>
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<tr>
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<tr>
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<tr>
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<td>544.nab_r</td>
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<tr>
<td>549.fotonik3d_r</td>
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</tr>
<tr>
<td>554.roms_r</td>
<td>6</td>
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</tr>
</tbody>
</table>

### Hardware

**CPU Name:** Intel Xeon E-2236  
**Max MHz:** 4800  
**Nominal:** 3400  
**Enabled:** 6 cores, 1 chip  
**Orderable:** 1 chip  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**Cache L2:** 256 KB I+D on chip per core  
**L3:** 12 MB I+D on chip per chip  
**Other:** None  
**Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)  
**Storage:** 1 x 1 TB SATA, 7200 RPM  
**Other:** None  

### Software

**OS:** Red Hat Enterprise Linux Server release 7.7 (Maipo)  
**Kernel:** 3.10.0-1062.el7.x86_64  
**Compiler:** 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 F01 08/21/2019 released Nov-2019  
**File System:** ext4  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None  
**Power Management:** --
## SPEC CPU®2017 Floating Point Rate Result

**NEC Corporation**

**Express5800/T110j-S (Intel Xeon E-2236)**

<table>
<thead>
<tr>
<th>Benchmark</th>
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<td>15.8</td>
<td>604</td>
<td>15.8</td>
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</tbody>
</table>

### SPECrate®2017_fp_base = 37.4

### SPECrate®2017_fp_peak = Not Run

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"

IRQ balance service was stopped using "systemctl stop irqbalance.service"

## Environment Variables Notes

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

LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"

## General Notes

Binaries compiled on a system with 1x Intel Core i9-799X 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:
SPEC CPU®2017 Floating Point Rate Result

NEC Corporation

Express5800/T110j-S (Intel Xeon E-2236)

SPECrate®2017_fp_base = 37.4
SPECrate®2017_fp_peak = Not Run

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

Test Date: Nov-2019
Hardware Availability: Nov-2019
Software Availability: Aug-2019

General Notes (Continued)

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.
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:
VT-x: Disabled
Energy Efficient P-state: Disabled
Energy Efficient Turbo: Disabled
Hyper-Threading: Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1be6e46a485a0011
running on t110js Tue Nov 5 07:02:54 2019

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) E-2236 CPU @ 3.40GHz
  1 "physical id"s (chips)
  6 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 6
On-line CPU(s) list: 0-5
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1

(Continued on next page)
## NEC Corporation

### Express5800/T110j-S (Intel Xeon E-2236)

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<thead>
<tr>
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**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation

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<td>Software Availability:</td>
<td>Aug-2019</td>
</tr>
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</table>

### Platform Notes (Continued)

- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 158
- **Model name:** Intel(R) Xeon(R) E-2236 CPU @ 3.40GHz
- **Stepping:** 10
- **CPU MHz:** 4767.553
- **CPU max MHz:** 4800.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 6816.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 256K
- **L3 cache:** 12288K
- **NUMA node0 CPU(s):** 0-5
- **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 nop1 xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch intel_pt ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm ptx smap clflushopt xsaveopt xsavec xgetbv1 dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp md_clear spec_ctrl intel_stibp flush_l1d

```
/proc/cpuinfo cache data
cache size : 12288 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
- node 0 size: 65283 MB
- node 0 free: 63392 MB
- node distances:
  - node 0
  - 0: 10

From `/proc/meminfo`

```
MemTotal:       65718068 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

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

```
os-release:
  NAME="Red Hat Enterprise Linux Server"
```

(Continued on next page)
NEC Corporation

Express5800/T110j-S (Intel Xeon E-2236)  

| SPECrate®2017_fp_base = 37.4 |
| SPECrate®2017_fp_peak = Not Run |

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

| Test Date: Nov-2019 |
| Hardware Availability: Nov-2019 |
| Software Availability: Aug-2019 |

Platform Notes (Continued)

```
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 t110js 3.10.0-1062.el7.x86_64 #1 SMP Thu Jul 18 20:25:13 UTC 2019 x86_64 x86_64
x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- **CVE-2018-3620 (L1 Terminal Fault):** Mitigation: PTE Inversion
- **Microarchitectural Data Sampling:** Mitigation: Clear CPU buffers; SMT disabled
- **CVE-2017-5754 (Meltdown):** Mitigation: PTI
- **CVE-2018-3639 (Speculative Store Bypass):** Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: Load fences, __user pointer sanitation
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Full retpoline, IBPB

```
run-level 3 Nov 5 06:57
```

```
SPEC is set to: /home/cpu2017
```

```
Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/sda3   ext4  908G  76G  786G 9% /
```

```
From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. F01 08/21/2019
Vendor: NEC
Product: Express5800/T110j-S [N8100-2806Y]
Serial: 0000002
```

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:
```
4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667
```

(End of data from sysinfo program)
**NEC Corporation**

**Express5800/T110j-S (Intel Xeon E-2236)**

**SPECrater®2017_fp_base = 37.4**

**SPECrater®2017_fp_peak = Not Run**

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### Compiler Version Notes

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<tr>
<th>Language</th>
<th>Compiler Packages</th>
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<td>C</td>
<td>519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</td>
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<tr>
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<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416</td>
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Express5800/T110j-S (Intel Xeon E-2236)

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SPECrates®2017_fp_peak = Not Run

CPU2017 License: 9006
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Test Date: Nov-2019
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Software Availability: Aug-2019

Compiler Version Notes (Continued)

Fortran, C  |  521.wrf_r(base) 527.cam4_r(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
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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
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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

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_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

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

NEC Corporation

Express5800/T110j-S (Intel Xeon E-2236)

SPECr ade®2017_fp_base = 37.4
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CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation
Test Date: Nov-2019
Hardware Availability: Nov-2019
Software Availability: Aug-2019

Base Portability Flags (Continued)

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=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

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 CPU®2017 Floating Point Rate Result

**NEC Corporation**  
**Express5800/T110j-S (Intel Xeon E-2236)**

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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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