NEC Corporation
Express5800/T110j-S (Intel Core i3-9300)

SPECspeed®2017_fp_base = 25.2
SPECspeed®2017_fp_peak = 25.5

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation
Test Date: Oct-2019
Hardware Availability: Nov-2019
Software Availability: Aug-2019

Threads

<table>
<thead>
<tr>
<th>Thread</th>
<th>Spec Speed 2017_fp_base</th>
<th>Spec Speed 2017_fp_peak</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>37.7</td>
<td>71.2</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>37.7</td>
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<td>619.lbm_s</td>
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<td>621.wrf_s</td>
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<td>31.5</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>17.9</td>
<td>17.9</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>30.2</td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>19.6</td>
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</tr>
<tr>
<td>644.nab_s</td>
<td>36.2</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16.2</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>13.9</td>
<td>13.9</td>
</tr>
</tbody>
</table>

---

**Hardware**

CPU Name: Intel Core i3-9300
Max MHz: 4300
Nominal: 3700
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
Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E, running at 2400)
Storage: 1 x 1 TB SATA, 7200 RPM
Other: None

OS: Red Hat Enterprise Linux Server release 7.7 (Maipo)
Kernel 3.10.0-1062.el7.x86_64
Compiler: C/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: Yes
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: 64-bit
Other: None
Power Management: --
NEC Corporation
Express5800/T110j-S (Intel Core i3-9300)

SPECspeed®2017_fp_base = 25.2
SPECspeed®2017_fp_peak = 25.5

Results Table

<table>
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</tbody>
</table>

SPECspeed®2017_fp_base = 25.2
SPECspeed®2017_fp_peak = 25.5

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes
Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"
OMP_STACKSIZE = "192M"

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:
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.
NEC Corporation

Express5800/T110j-S (Intel Core i3-9300)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed®2017_fp_base = 25.2
SPECspeed®2017_fp_peak = 25.5

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

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

Platform Notes

BIOS Settings:
VT-x: Disabled
Energy Efficient P-state: Disabled
Energy Efficient Turbo: Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edeb1e6e46a485a0011
running on t110js Wed Oct 30 04:51:51 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) Core(TM) i3-9300 CPU @ 3.70GHz
  1 "physical id"s (chips)
  4 "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: 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) Core(TM) i3-9300 CPU @ 3.70GHz
Stepping: 11
CPU MHz: 4275.415
CPU max MHz: 4300.0000
CPU min MHz: 800.0000
BogoMIPS: 7392.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K

(Continued on next page)
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 rdtsscp
  lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
  aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg fma
  cx16 xtfmr pdcg pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
  avx f16c rdrand lahf_lm abm 3dmnowprefetch intel_pt ssbd ibrs ibpb tpr_shadow
  vmx flexpriority ept vpid fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid mxp
  rdseed adx 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

/platform_notes

/proc/cpuinfo cache data
  cache size: 8192 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
  node 0 size: 65284 MB
  node 0 free: 63398 MB
  node distances:
    node 0
      0: 10

From /proc/meminfo
  MemTotal: 65719160 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.7 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.7.1"
    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

(Continued on next page)
NEC Corporation
Express5800/T110j-S (Intel Core i3-9300)

SPECspeed®2017_fp_base = 25.2
SPECspeed®2017_fp_peak = 25.5

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

Platform Notes (Continued)

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 sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full retpoline, IBPB

run-level 3 Oct 30 04:46

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 ext4 908G 72G 790G 9% /

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. F01 08/21/2019
Vendor: NEC
Product: Express5800/T110j-S [N8100-2804Y]
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)

Compiler Version Notes

==============================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
| 644.nab_s(base, peak)
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
==============================================================================

(Continued on next page)
NEC Corporation

Express5800/T110j-S (Intel Core i3-9300)  

| SPECspeed®2017_fp_base = 25.2 |
| SPECspeed®2017_fp_peak = 25.5 |

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

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

Compiler Version Notes (Continued)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

Fortran benchmarks:
```
ifort -m64
```

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

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```
SPEC CPU®2017 Floating Point Speed Result

NEC Corporation
Express5800/T110j-S (Intel Core i3-9300)

SPECspeed®2017_fp_base = 25.2
SPECspeed®2017_fp_peak = 25.5

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

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

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
   -assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
   -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
   -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
   -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
   -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
   -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

(Continued on next page)
### Peak Compiler Invocation (Continued)

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

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

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

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

Fortran benchmarks:
```bash
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs
```

```bash
649.fotonik3d_s: Same as 603.bwaves_s
```

```bash
654.roms_s: -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:
```bash
621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs
```

```bash
627.cam4_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs
```

```bash
628.pop2_s: Same as 621.wrf_s
```

(Continued on next page)
NEC Corporation

Express5800/T110j-S (Intel Core i3-9300)

| SPECspeed®2017_fp_base = 25.2 |
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Software Availability: Aug-2019

Peak 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=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

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:

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