# SPEC® CPU2017 Floating Point Speed Result

## NEC Corporation

**Express5800/T110i (Intel Xeon E3-1225 v6)**

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.8</td>
<td>22.1</td>
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**CPU2017 License:** 9006  
**Test Date:** Dec-2018  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation  
**Hardware Availability:** Apr-2017  
**Software Availability:** Mar-2018

### Threads

<table>
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<tr>
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<tr>
<td>603.bwaves_s</td>
<td>4</td>
<td>36.6</td>
<td>71.7</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>6.67</td>
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<tr>
<td>619.lbm_s</td>
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<td></td>
<td>27.2</td>
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<tr>
<td>621.wrf_s</td>
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<td>29.3</td>
<td>15.7</td>
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<tr>
<td>627.cam4_s</td>
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<tr>
<td>628.pop2_s</td>
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<td>638.imagick_s</td>
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<td>644.nab_s</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>4</td>
<td>16.2</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>4</td>
<td>14.0</td>
<td></td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E3-1225 v6  
- **Max MHz.:** 3700  
- **Nominal:** 3300  
- **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 PC4-2400T-E)  
- **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 18.0.2.199 of Intel C/C++  
- **Compiler for Linux:**  
- **Fortran:** Version 18.0.2.199 of Intel Fortran  
- **Compiler for Linux:**  
- **Parallel:** Yes  
- **Firmware:** Version 5.0.4008 06/07/2018 released Aug-2018  
- **File System:** ext4  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1
## SPEC CPU2017 Floating Point Speed Result

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Express5800/T110i (Intel Xeon E3-1225 v6)

### SPECspeed2017_fp_base = 21.8

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
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<td>71.7</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
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<td>36.6</td>
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<td>36.4</td>
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<td>785</td>
<td>6.67</td>
<td>784</td>
<td>6.68</td>
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<tr>
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<td>26.9</td>
<td>486</td>
<td>27.2</td>
</tr>
<tr>
<td>627.cam4_s</td>
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<td>563</td>
<td>15.8</td>
<td>563</td>
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<td>562</td>
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<tr>
<td>628.pop2_s</td>
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<tr>
<td>638.imagick_s</td>
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<td>14.0</td>
<td>1127</td>
<td>14.0</td>
<td>1125</td>
<td>14.0</td>
</tr>
</tbody>
</table>

**SPECspeed2017_fp_peak = 22.1**

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"

### General Notes

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

- **KMP_AFFINITY** = "granularity=fine,compact"
- **LD_LIBRARY_PATH** = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
- **OMP_STACKSIZE** = "192M"

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
```

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.

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NEC Corporation

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

NEC Corporation

Express5800/T110i (Intel Xeon E3-1225 v6)

SPECspeed2017_fp_peak = 22.1
SPECspeed2017_fp_base = 21.8

BIOS Settings:
Power Management Policy: Custom
Energy Performance: Performance
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on t110i Sat Dec 1 05:51:55 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 E3-1225 v6 @ 3.30GHz
  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) Xeon(R) CPU E3-1225 v6 @ 3.30GHz
Stepping: 9
CPU MHz: 3630.515
CPU max MHz: 3700.0000
CPU min MHz: 800.0000
BogoMIPS: 6624.00
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

(Continued on next page)
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| SPECspeed2017_fp_base | 21.8 |
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Software Availability: Mar-2018

Test Date: Dec-2018

Platform Notes (Continued)

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
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xptr pdcm pcid 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 vni flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1
dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp

/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: 65479 MB
    node 0 free: 63623 MB
    node distances:
      node 0
        0: 10

From /proc/meminfo
  MemTotal: 65920372 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 t110i 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:

(Continued on next page)
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Platform Notes (Continued)

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 Dec 1 05:46

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used  Avail  Use% Mounted on
/dev/sda3      ext4  909G  125G  738G  15% /

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. 5.0.4008 06/07/2018
    Memory:
        4x Micron 18ASF2G72AZ-2G3B1 16 GB 2 rank 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
 CC  619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
------------------------------------------------------------------------------
 icc (ICC) 18.0.2 20180210
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CC  619.lbm_s(peak)
------------------------------------------------------------------------------
 icc (ICC) 18.0.2 20180210
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  607.cactuBSSN_s(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.
------------------------------------------------------------------------------

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Express5800/T110i (Intel Xeon E3-1225 v6)

SPEC CPU2017 Floating Point Speed Result

SPECspeed2017_fp_base = 21.8
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Compiler Version Notes (Continued)

FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC  603.bwaves_s(peak) 649.fotonik3d_s(peak)
ifort (IFORT) 18.0.2 20180210
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CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
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icc (ICC) 18.0.2 20180210
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CC  621.wrf_s(peak) 628.pop2_s(peak)
ifort (IFORT) 18.0.2 20180210
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icc (ICC) 18.0.2 20180210
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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
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### 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:**

- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

**Fortran benchmarks:**

- `-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs L/usr/local/je5.0.1-64/lib -ljemalloc`

**Benchmarks using both Fortran and C:**

- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs L/usr/local/je5.0.1-64/lib -ljemalloc`

**Benchmarks using Fortran, C, and C++:**

- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs L/usr/local/je5.0.1-64/lib -ljemalloc`

### Peak Compiler Invocation

**C benchmarks:**

`icc -m64 -std=c11`

**Fortran benchmarks:**

`ifort -m64`

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

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:
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=3
-qopenmp -nostandard-realloc-lhs
649.fotonik3d_s: Same as 603.bwaves_s
654.roms_s: -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3
-qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
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=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs
627.cam4_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp

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

627.cam4_s (continued):
-DSPEC_OPENMP -nostandard-realloc-lhs

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

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:

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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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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