# SPEC® CPU2017 Floating Point Speed Result

## NEC Corporation

**Express5800/T110i (Intel Pentium G4560)**

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>12.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>12.7</td>
</tr>
</tbody>
</table>

**CPU2017 License**: 9006  
**Test Sponsor**: NEC Corporation  
**Tested by**: NEC Corporation  
**Test Date**: Jan-2019  
**Hardware Availability**: Apr-2017  
**Software Availability**: Mar-2018  

### Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (12.4)</th>
<th>SPECspeed2017_fp_peak (12.7)</th>
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<tbody>
<tr>
<td>603.bwaves_s 2</td>
<td>2</td>
<td>16.5</td>
</tr>
<tr>
<td>607.cactuBSSN_s 2</td>
<td>2</td>
<td>6.55</td>
</tr>
<tr>
<td>619.lbm_s 2</td>
<td>2</td>
<td>6.55</td>
</tr>
<tr>
<td>621.wrf_s 2</td>
<td>2</td>
<td>13.2</td>
</tr>
<tr>
<td>627.cam4_s 2</td>
<td>2</td>
<td>8.27</td>
</tr>
<tr>
<td>628.pop2_s 2</td>
<td>2</td>
<td>8.27</td>
</tr>
<tr>
<td>638.imagick_s 2</td>
<td>2</td>
<td>4.38</td>
</tr>
<tr>
<td>644.nab_s 2</td>
<td>2</td>
<td>13.1</td>
</tr>
<tr>
<td>649.fotonik3d_s 2</td>
<td>2</td>
<td>10.4</td>
</tr>
<tr>
<td>654.roms_s 2</td>
<td>2</td>
<td>10.8</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>OS</th>
<th>Red Hat Enterprise Linux Server release 7.4 (Maipo)</th>
</tr>
</thead>
</table>
| 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 | Yes |
| Firmware | NEC BIOS 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: None |

**CPU Name**: Intel Pentium G4560  
**Max MHz.**: 3500  
**Nominal**: 3500  
**Enabled**: 2 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**: 3 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
Results Table

<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>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>2</td>
<td>956</td>
<td>61.7</td>
<td>953</td>
<td>61.9</td>
<td>952</td>
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<td>956</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>1011</td>
<td>16.5</td>
<td>1009</td>
<td>16.5</td>
<td>1010</td>
<td>16.5</td>
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<td>1002</td>
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<td>6.55</td>
<td>800</td>
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<tr>
<td>621.wrf_s</td>
<td>2</td>
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<td>13.2</td>
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<td>13.2</td>
<td>1002</td>
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<tr>
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<tr>
<td>628.pop2_s</td>
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<td>12.9</td>
<td>923</td>
<td>12.9</td>
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<td>895</td>
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<td>638.imagick_s</td>
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<td>4.37</td>
<td>3292</td>
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<td>3291</td>
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<tr>
<td>644.nab_s</td>
<td>2</td>
<td>1337</td>
<td>13.1</td>
<td>1337</td>
<td>13.1</td>
<td>1336</td>
<td>13.1</td>
<td>2</td>
<td>1342</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>2</td>
<td>574</td>
<td>15.9</td>
<td>573</td>
<td>15.9</td>
<td>573</td>
<td>15.9</td>
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<td>654.roms_s</td>
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<td>10.4</td>
<td>1514</td>
<td>10.4</td>
<td>2</td>
<td>1463</td>
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</tbody>
</table>

SPECspeed2017_fp_base = 12.4
SPECspeed2017_fp_peak = 12.7

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/intel64"
OMP_STACKSIZE = "192M"

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

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/T110i (Intel Pentium G4560)

SPECspeed2017_fp_base = 12.4
SPECspeed2017_fp_peak = 12.7

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

Test Date: Jan-2019
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Platform Notes

BIOS Settings:
- Power Management Policy: Custom
- Energy Performance: Performance
- Hyper-Threading: Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on t110i Wed Jan 9 01:25:22 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) Pentium(R) CPU G4560 @ 3.50GHz
  1 "physical id"s (chips)
  2 "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 : 2
siblings : 2
physical 0: cores 0 1
```

From lscpu:

```
Architecture:     x86_64
CPU op-mode(s):  32-bit, 64-bit
Byte Order:      Little Endian
CPU(s):          2
On-line CPU(s) list: 0,1
Thread(s) per core: 1
Core(s) per socket: 2
Socket(s):       1
NUMA node(s):    1
Vendor ID:       GenuineIntel
CPU family:      6
Model:           158
Model name:      Intel(R) Pentium(R) CPU G4560 @ 3.50GHz
Stepping:        9
CPU MHz:         3407.851
CPU max MHz:     3500.0000
CPU min MHz:     800.0000
BogoMIPS:        7008.00
Virtualization: VT-x
L1d cache:       32K
L1i cache:       32K
L2 cache:        256K
L3 cache:        3072K
NUMA node0 CPU(s): 0,1
```
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**Platform Notes (Continued)**

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 nopl xtopology nonstop_tsc
aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 cx16 xtpr
pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave rdrand
lahf_lm abm 3dnowprefetch ebpx save rdcryptor vsxsaes xsaveopt xsaveopt xgetbv1 dtherm pln 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)
nodem0 cpus: 0 1
node 0 size: 65480 MB
node 0 free: 63636 MB
node distances:
node 0
0: 10
```

From `/proc/meminfo`
```
MemTotal: 65921740 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

From `/etc/*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.el17.x86_64 #1 SMP Fri Feb 23 18:54:16 UTC 2018 x86_64
x86_64 x86_64 GNU/Linux
```

```
run-level 3 Jan 9 01:19
```

(Continued on next page)
NEC Corporation
Express5800/T110i (Intel Pentium G4560)

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Platform Notes (Continued)

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 SM BIOS" 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) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC   619.lbm_s(peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  607.cactuBSSN_s(base)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC   607.cactuBSSN_s(peak)
==============================================================================
icpc (ICC) 18.0.0 20170811

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NEC Corporation

Express5800/T110i (Intel Pentium G4560)

SPEC CPU2017 Floating Point Speed Result

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SPECspeed2017_fp_base = 12.4
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Tested by: NEC Corporation

Test Date: Jan-2019
Hardware Availability: Apr-2017
Software Availability: Mar-2018

Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

-------------------------------------------------------------------------------------
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
-------------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------
FC  603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)
-------------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
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CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
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icc (ICC) 18.0.0 20170811
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CC  621.wrf_s(peak) 628.pop2_s(peak)
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icc (ICC) 18.0.0 20170811
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Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

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**SPEC CPU2017 Floating Point Speed Result**  
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Express5800/T110i (Intel Pentium G4560)  

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### Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:  
ifort icc  
Benchmarks using Fortran, C, and C++:  
icpc icc ifort

### 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:**  
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

**Fortran benchmarks:**  
-DSPEC_OPENMP -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp  
-nostandard-realloc-lhs -align array32byte

**Benchmarks using both Fortran and C:**  
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs -align array32byte

**Benchmarks using Fortran, C, and C++:**  
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs -align array32byte
NEC Corporation
Express5800/T110i (Intel Pentium G4560)

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CPU2017 License: 9006
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Base Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

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

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

Peak Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -02 -xSSE4.2
-qopt-prefetch -ipo -03 -no-prec-div -ffinite-math-only
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP

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

638.imagick_s: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_SUPPRESS_OPENMP

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:

603.bwaves_s: basepeak = yes
649.fotonik3d_s: basepeak = yes

654.roms_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xSSE4.2 -qopt-prefetch -ipo -O3
-no-prec-div -ffinite-math-only -qopt-mem-layout-trans=3
-qopenmp -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xSSE4.2
-qopt-prefetch -ipo -O3 -no-prec-div -ffinite-math-only
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

627.cam4_s: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

-prof-gen(pass 1) -prof-use(pass 2) -O2 -xSSE4.2 -qopt-prefetch -ipo
-O3 -no-prec-div -ffinite-math-only -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
-align array32byte

Peak Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

(Continued on next page)
NEC Corporation
Express5800/T110i (Intel Pentium G4560)

**SPECspeed2017_fp_peak** = 12.7
**SPECspeed2017_fp_base** = 12.4

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**Peak Other Flags (Continued)**

Benchmarks using both Fortran and C:

- `-m64 -std=c11`

Benchmarks using Fortran, C, and C++:

- `-m64 -std=c11`

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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