SPEC® CPU2017 Floating Point Rate Result

NEC Corporation

Express5800/T110i-S (Intel Pentium G4560)

SPECraten2017_fp_base = 14.4
SPECraten2017_fp_peak = 14.7

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

Test Date: Nov-2018
Hardware Availability: Apr-2017
Software Availability: Mar-2018

Copies

503.bwaves_r 4
507.cactuBSSN_r 4
508.namd_r 4
510.parest_r 4
511.povray_r 4
519.hmmer_r 4
521.wrf_r 4
526.blender_r 4
527.cam4_r 4
538.imagick_r 4
544.nab_r 4
549.fotonik3d_r 4
554.roms_r 4

Hardware

CPU Name: Intel Pentium G4560
Max MHz.: 3500
Nominal: 3500
Enabled: 2 cores, 1 chip, 2 threads/core
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

Software

OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)
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: 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

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</tbody>
</table>

Specrate2017_fp_base = 14.4
Specrate2017_fp_peak = 14.7

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 i7-4790 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)
## SPEC CPU2017 Floating Point Rate Result

### NEC Corporation

**NEC Corporation**

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

**SPECrate2017_fp_base = 14.4**  
**SPECrate2017_fp_peak = 14.7**

---

### General Notes (Continued)

*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:** r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
**running on t110is Thu Nov  1 21:06:04 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](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)
            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 : 2
             siblings : 4
             physical 0: cores 0 1
```

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: 2
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: 3272.363
CPU max MHz: 3500.000
```

(Continued on next page)
## NEC Corporation

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

<table>
<thead>
<tr>
<th>SPECrate2017_fp_peak</th>
<th>SPECrate2017_fp_base</th>
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<td>14.7</td>
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**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Test Date:** Nov-2018  
**Hardware Availability:** Apr-2017  
**Tested by:** NEC Corporation  
**Software Availability:** Mar-2018

### Platform Notes (Continued)

- **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):** 0-3  
- **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 pdselgb rdtscp 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 cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave rdrand lahf_lm abm 3dnowprefetch epb invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vnumi flexpriority ept vpid fsgsbase tsc_adjust smep erms invpcid mpx rdseed smap clflushopt xsaveopt xsavec xgetbv1 dtherm arat pln pts hwp hwp_notify hwp_act_window hwp_epp

/proc/cpuinfo cache data  
```plaintext
 cache size : 3072 KB
```

From numactl  
WARNING: a numactl 'node' might or might not correspond to a physical chip.  
```plaintext
 available: 1 nodes (0)  
 node 0 cpus: 0 1 2 3  
 node 0 size: 65475 MB  
 node 0 free: 63625 MB  
 node distances:  
 node 0  
 0: 10
```

From /proc/meminfo  
```plaintext
 MemTotal: 65916052 kB  
 HugePages_Total: 0  
 Hugepagesize: 2048 kB
```

From /etc/*release* /etc/*version*  
```plaintext
 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)
```

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

NEC Corporation

Express5800/T110i-S (Intel Pentium G4560)

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SPECrate2017_fp_peak = 14.7

CPU2017 License: 9006
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Tested by: NEC Corporation
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Platform Notes (Continued)

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

run-level 3 Nov 1 21:00

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext4  909G  111G  752G  13% /

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)

Compiler Version Notes

==============================================================================
CC   519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CC   519.lbm_r(peak) 544.nab_r(peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

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

**SPEC CPU2017 Floating Point Rate Result**

** SPECrate2017_fp_peak = 14.7  
** SPECrate2017_fp_base = 14.4  

---

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

---

**Compiler Version Notes (Continued)**

CXXC 508.namd_r(peak) 510.parest_r(peak)  
icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

CC 511.povray_r(base) 526.blender_r(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.

---

CC 511.povray_r(peak) 526.blender_r(peak)  
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.

---

FC 507.cactuBSSN_r(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 507.cactuBSSN_r(peak)  
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**NEC Corporation**

Express5800/T110i-S (Intel Pentium G4560)

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### Compiler Version Notes (Continued)

```
FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)
    -----------------------------------------------
    ifort (IFORT) 18.0.0 20170811
    Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
    -----------------------------------------------

FC  554.roms_r(peak)
    -----------------------------------------------
    ifort (IFORT) 18.0.0 20170811
    Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
    -----------------------------------------------

CC  521.wrf_r(base) 527.cam4_r(base)
    -----------------------------------------------
    ifort (IFORT) 18.0.0 20170811
    icc (ICC) 18.0.0 20170811
    Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
    -----------------------------------------------

CC  521.wrf_r(peak) 527.cam4_r(peak)
    -----------------------------------------------
    ifort (IFORT) 18.0.0 20170811
    icc (ICC) 18.0.0 20170811
    Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

---

### Base Compiler Invocation

**C benchmarks:**
- icc

**C++ benchmarks:**
- icpc

**Fortran benchmarks:**
- ifort

**Benchmarks using both Fortran and C:**
- ifort icc

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

Benchmarks using both C and C++:
icpc icc

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

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

C++ benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

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

Benchmarks using both C and C++:
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only

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

Benchmarks using both C and C++ (continued):
-qopt-mem-layout-trans=3

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

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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

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

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

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

(Continued on next page)
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Copyright 2017-2018 Standard Performance Evaluation Corporation

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Peak Compiler Invocation (Continued)

Benchmarks using both C and C++:
icpc icc

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

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 -xSSE4.2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

538.imagick_r: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 519.lbm_r

C++ benchmarks:
508.namd_r: basepeak = yes

510.parest_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

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

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs

(Continued on next page)
PEC CPU2017 Floating Point Rate Result

SPECrate2017_fp_base = 14.4
SPECrate2017_fp_peak = 14.7

NEC Corporation
Express5800/T110i-S (Intel Pentium G4560)

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

Test Date: Nov-2018
Hardware Availability: Apr-2017
Software Availability: Mar-2018

554.roms_r (continued):
-align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3
-nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
507.cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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

Benchmarks using both C 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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<th>NEC Corporation</th>
<th>SPECrate2017_fp_base = 14.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Express5800/T110i-S (Intel Pentium G4560)</td>
<td>SPECrate2017_fp_peak = 14.7</td>
</tr>
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<td>CPU2017 License: 9006</td>
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</tbody>
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