### NEC Corporation

**Express5800/R110i-1 (Intel Pentium G4560)**

<table>
<thead>
<tr>
<th>Application</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>619.lbm_s</td>
<td>6.52</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>6.53</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>8.26</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>12.9</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>4.38</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>13.1</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>15.8</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>10.4</td>
</tr>
</tbody>
</table>

**Software**

- **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

**Hardware**

- **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
NEC Corporation

Express5800/R110i-1 (Intel Pentium G4560)

SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECspeed2017_fp_base = 12.4

SPECspeed2017_fp_peak = 12.6

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>2</td>
<td>963</td>
<td>61.3</td>
<td>955</td>
<td>61.8</td>
<td>955</td>
<td>61.8</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>2</td>
<td>1009</td>
<td>16.5</td>
<td>1011</td>
<td>16.5</td>
<td>1010</td>
<td>16.5</td>
</tr>
<tr>
<td>619.llvm_s</td>
<td>2</td>
<td>803</td>
<td>6.53</td>
<td>803</td>
<td>6.52</td>
<td>803</td>
<td>6.52</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>2</td>
<td>1003</td>
<td>13.2</td>
<td>1004</td>
<td>13.2</td>
<td>1004</td>
<td>13.2</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>2</td>
<td>1073</td>
<td>8.26</td>
<td>1073</td>
<td>8.26</td>
<td>1074</td>
<td>8.25</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>2</td>
<td>922</td>
<td>12.9</td>
<td>923</td>
<td>12.9</td>
<td>922</td>
<td>12.9</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>2</td>
<td>3292</td>
<td>4.38</td>
<td>3290</td>
<td>4.38</td>
<td>3288</td>
<td>4.39</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>2</td>
<td>1336</td>
<td>13.1</td>
<td>1336</td>
<td>13.1</td>
<td>1336</td>
<td>13.1</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>2</td>
<td>577</td>
<td>15.8</td>
<td>576</td>
<td>15.8</td>
<td>576</td>
<td>15.8</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>2</td>
<td>1521</td>
<td>10.4</td>
<td>1523</td>
<td>10.3</td>
<td>1471</td>
<td>10.7</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 12.4

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 i7-4790 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.
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 96c45e4568ad54c135fd618bfc091c0f
running on r11011 Tue Oct 30 20:02:55 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) 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: 3347.421
- 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

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

NEC Corporation
Express5800/R110i-1 (Intel Pentium G4560)

SPECspeed2017_fp_base = 12.4
SPECspeed2017_fp_peak = 12.6

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

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

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 abtm 3dnowprefetch pdpe1gds dts ept vpid fpgasave vmx smep xsaveopt xsaveopt
xsaveprecise xsaveapic smep cr4envtsys smep cr4estcprecise

From /proc/cpuinfo cache data
  cache size : 3072 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
   node 0 size: 65475 MB
   node 0 free: 63633 MB
   node distances:

   From /proc/meminfo
   MemTotal:       65917212 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 r110i1 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 Oct 30 19:57

(Continued on next page)
<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEC is set to: /home/cpu2017</td>
</tr>
<tr>
<td>Filesystem</td>
</tr>
<tr>
<td>/dev/sda3</td>
</tr>
</tbody>
</table>

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 SMI BIOS" 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)

<table>
<thead>
<tr>
<th>Compiler Version Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC 619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)</td>
</tr>
<tr>
<td>icc (ICC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>icc (ICC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>icpc (ICC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>icpcc (ICPC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>icpc (ICC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

(Continued on next page)
NEC Corporation

Express5800/R110i-1 (Intel Pentium G4560)

SPEC CPU2017 Floating Point Speed Result

SPECspeed2017_fp_base = 12.4
SPECspeed2017_fp_peak = 12.6

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

Test Date: Oct-2018
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.

CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
ifort (IFORT) 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  621.wrf_s(peak) 628.pop2_s(peak)
ifort (IFORT) 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.

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort
SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation
Express5800/R110i-1 (Intel Pentium G4560)

| SPECspeed2017_fp_base = 12.4 |
| SPECspeed2017_fp_peak = 12.6 |

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

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/R110i-1 (Intel Pentium G4560)

SPECspeed2017_fp_base = 12.4
SPECspeed2017_fp_peak = 12.6

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

**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) -O2 -xSSE4.2
-qopt-prefetch -ipo -O3 -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 -gopenmp
  -DSPEC_OPENMP

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:

603.bwaves_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
  -gopenmp -nostandard-realloc-lhs -align array32byte

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

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 -gopenmp
  -DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

627.cam4_s: basepeak = yes

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
-03 -no-prec-div -ffinite-math-only -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
-align array32byte

Peak Other Flags

C benchmarks:
- m64 -std=c11

Fortran benchmarks:
- m64

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

(Continued on next page)
**PEC CPU2017 Floating Point Speed Result**

**NEC Corporation**

Express5800/R110i-1 (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>12.6</td>
</tr>
</tbody>
</table>

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

## Peak Other Flags (Continued)

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:
- [NEC-Platform-Settings-110i-RevA.xml](http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-110i-RevA.xml)

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.2 on 2018-10-30 07:02:54-0400.  
Originally published on 2018-11-27.