<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong> Intel Pentium Gold G5420</td>
<td><strong>OS:</strong> Red Hat Enterprise Linux Server release 7.7 (Maipo)</td>
</tr>
<tr>
<td>Max MHz: 3800</td>
<td><strong>Compiler:</strong> C/C++: Version 19.0.0.117 of Intel C/C++ Compiler Build 20180804 for Linux; Fortran: Version 19.0.0.117 of Intel Fortran Compiler Build 20180804 for Linux</td>
</tr>
<tr>
<td>Nominal: 3800</td>
<td><strong>Parallel:</strong> No</td>
</tr>
<tr>
<td>Enabled: 2 cores, 1 chip, 2 threads/core</td>
<td><strong>Firmware:</strong> NEC BIOS Version F01 08/21/2019 released Nov-2019</td>
</tr>
<tr>
<td>Orderable: 1 chip</td>
<td><strong>File System:</strong> ext4</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td><strong>System State:</strong> Run level 3 (multi-user)</td>
</tr>
<tr>
<td>L2: 256 KB I+D on chip per core</td>
<td><strong>Base Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td>L3: 4 MB I+D on chip per chip</td>
<td><strong>Peak Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td><strong>Other:</strong> None</td>
</tr>
<tr>
<td>Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E, running at 2400)</td>
<td><strong>Power Management:</strong> --</td>
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<tr>
<td>Storage: 1 x 1 TB SATA, 7200 RPM</td>
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</tr>
<tr>
<td>Other: None</td>
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</table>

**NEC Corporation**

Express5800/T110j-S (Intel Pentium Gold G5420)

**SPEC CPU®2017 Floating Point Rate Result**

**SPECrate®2017_fp_base = 15.6**

**SPECrate®2017_fp_peak = 15.9**

- **Test Sponsor:** NEC Corporation
- **Test Date:** Oct-2019
- **Hardware Availability:** Nov-2019
- **Software Availability:** Aug-2019

### SPECrate Table

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<td>508.namd_r</td>
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<td>510.parest_r</td>
<td>17.0</td>
<td>19.4</td>
</tr>
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<td>511.povray_r</td>
<td>15.0</td>
<td>19.1</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>14.8</td>
<td>15.0</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>15.9</td>
<td>20.1</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>15.9</td>
<td>16.6</td>
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<tr>
<td>527.cam4_r</td>
<td>14.3</td>
<td>16.5</td>
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<tr>
<td>538.imagick_r</td>
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<td>544.nab_r</td>
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<tr>
<td>549.fotonik3d_r</td>
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This results table is generated from the SPEC CPU®2017 floating point rate results for the NEC Corporation's Express5800/T110j-S (Intel Pentium Gold G5420) system. The SPECrate®2017_fp_base is 15.6, and the SPECrate®2017_fp_peak is 15.9. The results are presented in a table format with columns for the program names and their respective SPECrate®2017_fp_peak and SPECrate®2017_fp_base values.
## NEC Corporation

Express5800/T110j-S (Intel Pentium Gold G5420)

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</table>

**SPECrate**\(^{\text{\textregistered}}\)\(^{\text{\textcopyright}}\)\(_{2017}\) \(\text{fp\_base} = 15.6\)  
**SPECrate**\(^{\text{\textregistered}}\)\(^{\text{\textcopyright}}\)\(_{2017}\) \(\text{fp\_peak} = 15.9\)

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"  
IRQ balance service was stopped using "systemctl stop irqbalance.service"

### 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 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.

(Continued on next page)
## NEC Corporation

**Express5800/T110j-S (Intel Pentium Gold G5420)**

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>NEC Corporation</th>
</tr>
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<tbody>
<tr>
<td>Tested by:</td>
<td>NEC Corporation</td>
</tr>
<tr>
<td>CPU2017 License:</td>
<td>9006</td>
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<tr>
<td>Test Date:</td>
<td>Oct-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Nov-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Aug-2019</td>
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</table>

### SPEC CPU 2017 Floating Point Rate Result

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>15.6</th>
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<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>15.9</td>
</tr>
</tbody>
</table>

### General Notes (Continued)

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:**
- VT-x: Disabled

**Sysinfo program** /
/home/cpu2017/bin/sysinfo

**Rev:** r5974 of 2018-05-19 9bcd8f2999c33d61f64985e45859ea9

**running on t110js Fri Oct 25 23:23:31 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) Gold G5420 CPU @ 3.80GHz
  - 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) Gold G5420 CPU @ 3.80GHz
- **Stepping:** 11
- **CPU MHz:** 3689.135
- **CPU max MHz:** 3800.0000
- **CPU min MHz:** 800.0000

(Continued on next page)
NEC Corporation

Express5800/T110j-S (Intel Pentium Gold G5420)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECrater®2017_fp_base = 15.6
SPECrater®2017_fp_peak = 15.9

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

Platform Notes (Continued)

BogoMIPS: 7584.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 4096K
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 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 sdbg cx16
xtrm pcmd pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave rdrand
lahf_lm abm 3dnowprefetch intel_pt ssbd ibrs ibpb stibp tpr_shadow vnmi finxpriorit
ept vpid fsgsbase tsc_adjust smep erms invpcid mpx rdseed smap clflushopt xsaveopt
xsavec xgetbv1 dtherm arat pin ptr hwp hwp_notfiy hwp_act_window hwp_epp md_clear
spec_ctrl intel_stibp flush_lid

/proc/cpuinfo cache data
cache size : 4096 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: 63408 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"
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)

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

NEC Corporation

Express5800/T110j-S (Intel Pentium Gold G5420)

SPECrate®2017_fp_base = 15.6

SPECrate®2017_fp_peak = 15.9

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 (Continued)

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

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
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 25 23:17

SPEC is set to: /home/cpu2017
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext4  908G   32G  830G   4% /

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. F01 08/21/2019
Memory:
4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
| 544.nab_r(base, peak)
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)
==============================================================================

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

(Continued on next page)
NEC Corporation

Express5800/T110j-S (Intel Pentium Gold G5420)

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### Compiler Version Notes (Continued)

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</tbody>
</table>
SPEC CPU®2017 Floating Point Rate Result

NEC Corporation

Express5800/T110j-S (Intel Pentium Gold G5420)

SPECrate®2017_fp_base = 15.6
SPECrate®2017_fp_peak = 15.9

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

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

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

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

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

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.ibm_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

(Continued on next page)
NEC Corporation
Express5800/T1 10j-S (Intel Pentium Gold G5420)

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-qopt-mem-layout-trans=3

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

Benchmarks using both C and C++:
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-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 -auto -nostandard-realloc-lhs
-align array32byte

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

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

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

Express5800/T110j-S (Intel Pentium Gold G5420)

SPECrate®2017_fp_base = 15.6
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CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation
Test Date: Oct-2019
Hardware Availability: Nov-2019
Software Availability: Aug-2019

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.ibm_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 538.imagick_r

C++ benchmarks:
508.namd_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
510.parest_r: -xSSE4.2 -ipo -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 -auto -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 -auto -nostandard-realloc-lhs -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 -auto -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:

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

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -03
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:
-xSSE4.2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
-align array32byte

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-10-25 10:23:30-0400.
Report generated on 2019-11-12 15:00:42 by CPU2017 PDF formatter v6255.
Originally published on 2019-11-12.