# SPEC CPU®2017 Integer Rate Result

## NEC Corporation

Express5800/GT110j (Intel Pentium Gold G5420)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<tbody>
<tr>
<td>12.9</td>
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</table>

**Copyright 2017-2019 Standard Performance Evaluation Corporation**

### CPU2017 License: 9006

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

### Hardware

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### Software

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<td>Other:</td>
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*NEC Corporation*  
*Express5800/GT110j (Intel Pentium Gold G5420)*  
*SPECrate®2017_int_base = 12.9*  
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**Results Table**

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

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.

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**  
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### NEC Corporation

**Express5800/GT110j (Intel Pentium Gold G5420)**

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<td>Oct-2019</td>
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<td>Hardware Availability:</td>
<td>Nov-2019</td>
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**General Notes (Continued)**

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  

**Platform Notes**

BIOS Settings:  
VT-x: Disabled  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on gt110j Tue Oct 29 11:03:41 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 @ 3.80GHhz  
  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 @ 3.80GHhz  
Stepping: 11  
CPU MHz: 3786.083  
CPU max MHz: 3800.0000  
CPU min MHz: 800.0000  
BogoMIPS: 7584.00

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Test Sponsor: NEC Corporation
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Platform Notes (Continued)

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 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 sdbg cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave xsaveopt xsavec xgetbv1 xsaveopt xsaveopt xgetbv1 dtherm atr pln pts hwp hwp_notify hwp_act_window hwp_epp md_clear spec_ctrl intel_stibp flush_l1d

/platform/cpuid 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: 65441 MB
node 0 free: 63561 MB
node distances:
node 0
0: 10

From /proc/meminfo
MemTotal: 65880068 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)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.7:ga:server

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Test Date: Oct-2019

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Software Availability: Aug-2019

Platform Notes (Continued)

uname -a:
   Linux gt110j 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 29 10:58

SPEC is set to: /home/cpu2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sda3 ext4 1.8T 40G 1.7T  3% /

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       | 502.gcc_r(peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version
  19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
       | 525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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<th>520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)</th>
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<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.0.117 Build 20180804</td>
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### NEC Corporation

**Express5800/GT110j (Intel Pentium Gold G5420)**

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<tr>
<th>SPEC CPU®2017 Integer Rate Result</th>
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<tr>
<td><strong>CPU2017 License:</strong> 9006</td>
<td><strong>Test Date:</strong> Oct-2019</td>
</tr>
<tr>
<td><strong>Test Sponsor:</strong> NEC Corporation</td>
<td><strong>Hardware Availability:</strong> Nov-2019</td>
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<tr>
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#### Compiler Version Notes (Continued)

Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.0.117 Build 20180804
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### Base Compiler Invocation

C benchmarks:
-icc -m64 -std=c11

C++ benchmarks:
-icpc -m64

Fortran benchmarks:
-ifort -m64

### Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

### Base Optimization Flags

C benchmarks:
- W1, -z, muldefs -xsSE4.2 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

(Continued on next page)
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

NEC Corporation
Express5800/GT110j (Intel Pentium Gold G5420)

SPECrate®2017_int_base = 12.9
SPECrate®2017_int_peak = 13.9

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

Base Optimization Flags (Continued)

C++ benchmarks:
-Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11

502.gcc_r: icc -m32 -std=c11 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.0.117/linux/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m64

523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.0.117/linux/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
**SPEC CPU®2017 Integer Rate Result**

**NEC Corporation**

Express5800/GT110j (Intel Pentium Gold G5420)

| SPECrate®2017_int_base = 12.9 | SPECrate®2017_int_peak = 13.9 |

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

### Peak Optimization Flags

**C benchmarks:**

- 500.perlbench_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
  `-xSSE4.2 -O3 -no-prec-div -qopt-mem-layout-trans=3`  
  `-fno-strict-overflow -L/usr/local/je5.0.1-64/lib`  
  `-ljemalloc`

- 502.gcc_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
  `-xSSE4.2 -O3 -no-prec-div -qopt-mem-layout-trans=3`  
  `-L/usr/local/je5.0.1-32/lib`  
  `-ljemalloc`

- 505.mcf_r: `-Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div`  
  `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib`  
  `-ljemalloc`

- 525.x264_r: `-Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div`  
  `-qopt-mem-layout-trans=3 -fno-alias`  
  `-L/usr/local/je5.0.1-64/lib`  
  `-ljemalloc`

- 557.xz_r: Same as 505.mcf_r

**C++ benchmarks:**

- 520.omnetpp_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
  `-xSSE4.2 -O3 -no-prec-div -qopt-mem-layout-trans=3`  
  `-L/usr/local/je5.0.1-64/lib`  
  `-ljemalloc`

- 523.xalancbmk_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
  `-xSSE4.2 -O3 -no-prec-div -qopt-mem-layout-trans=3`  
  `-L/usr/local/je5.0.1-32/lib`  
  `-ljemalloc`

- 531.deepsjeng_r: Same as 520.omnetpp_r

- 541.leela_r: Same as 520.omnetpp_r

**Fortran benchmarks:**

- `-Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div`  
  `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`  
  `-L/usr/local/je5.0.1-64/lib`  
  `-ljemalloc`

The flags files that were used to format this result can be browsed at:

| NEC Corporation | SPECrate®2017_int_base = 12.9 |
| Express5800/GT110j (Intel Pentium Gold G5420) | SPECrate®2017_int_peak = 13.9 |

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

You can also download the XML flags sources by saving the following links:


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