## NEC Corporation

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

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>11.6</th>
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<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>12.4</td>
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</table>

### CPU2017 License: 9006

**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation  
**Hardware Availability:** Apr-2017  
**Software Availability:** Mar-2018

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<tr>
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</tr>
</tbody>
</table>

### 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)  
- **Kernel:** 3.10.0-693.21.1.el7.x86_64  
- **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:** 32/64-bit  
- **Other:** jemalloc memory allocator library V5.0.1
**SPEC CPU2017 Integer Rate Result**

**NEC Corporation**

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

**SPECrate2017_int_base = 11.6**

**SPECrate2017_int_peak = 12.4**

---

**Results Table**

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</tbody>
</table>

**SPECrate2017_int_base = 11.6**

**SPECrate2017_int_peak = 12.4**

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
```

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;

ejemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;


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)

(Continued on next page)
SPEC CPU2017 Integer Rate Result

NEC Corporation

Express5800/T110i-S (Intel Pentium G4560)

SPECrate2017_int_base = 11.6
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CPU2017 License: 9006
Test Sponsor: NEC Corporation
Tested by: NEC Corporation

General Notes (Continued)

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
DCU Streamer Prefetcher: Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bce091e0f
running on t110is Thu Nov 1 12:15:46 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)
  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: 3167.636
CPU max MHz: 3500.000

(Continued on next page)
SPEC CPU2017 Integer Rate Result

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Express5800/T110i-S (Intel Pentium G4560)

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SPECrate2017_int_base = 11.6
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Test Date: Nov-2018
Hardware Availability: Apr-2017
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

/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 2 3
  node 0 size: 65475 MB
  node 0 free: 63622 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65916052 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)
NEC Corporation

Express5800/T110i-S (Intel Pentium G4560)

| SPECrate2017_int_base | 11.6 |
| SPECrate2017_int_peak | 12.4 |

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

**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 t110iis 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 12:10

SPEC is set to: /home/cpu2017

```
<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use% Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>ext4</td>
<td>909G</td>
<td>111G</td>
<td>752G</td>
<td>13% /</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 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  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
    525.x264_r(base, peak) 557.xz_r(base, peak)
```

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

```
CC  500.perlbench_r(peak) 502.gcc_r(peak)
```

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

```
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
    541.leela_r(base)
```

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

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

SPEC CPU2017 Integer Rate Result
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SPECrate2017_int_base = 11.6
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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

Compiler Version Notes (Continued)

CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak) 541.leela_r(peak)

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

FC 548.exchange2_r(base, peak)
ifort (IFORT) 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

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
# SPEC CPU2017 Integer Rate Result

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

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<td>Tested by: NEC Corporation</td>
<td>Software Availability: Mar-2018</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

The following flags are used for optimization:

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

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

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

### Base Other Flags

**C benchmarks:**
- `-m64`  
  - `-std=c11`

**C++ benchmarks:**
- `-m64`

**Fortran benchmarks:**
- `-m64`

### Peak Compiler Invocation

**C benchmarks:**
- `icc`

**C++ benchmarks:**
- `icpc`

**Fortran benchmarks:**
- `ifort`

### Peak Portability Flags

- `500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64`
- `502.gcc_r: -D_FILE_OFFSET_BITS=64`

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# SPEC CPU2017 Integer Rate Result

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

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### Peak Portability Flags (Continued)

- `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`

### 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-prefetch -qopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc`
- `502.gcc_r`: `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch -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-prefetch -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-prefetch -qopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc`
- `557.xz_r`: `basepeak = yes`

#### C++ benchmarks:

- `520.omnetpp_r`: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`
- `523.xalancbmk_r`: `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch`

(Continued on next page)
PEC CPU2017 Integer Rate Result

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

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CPU2017 License: 9006
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Peak Optimization Flags (Continued)

523.xalancbmk_r (continued):
-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-prefetch
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Other Flags

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

502.gcc_r: -m32 -std=c11

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

523.xalancbmk_r: -m32

Fortran benchmarks:
-m64

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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