# SPEC® CPU2017 Integer Rate Result

## NEC Corporation

**Express5800/T110i-S (Intel Xeon E3-1230 v6)**

**SPECrate2017_int_base** = 27.3  
**SPECrate2017_int_peak** = 29.1

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

### Hardware

- **CPU Name:** Intel Xeon E3-1230 v6  
  - Max MHz.: 3900  
  - Nominal: 3500  
  - Enabled: 4 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: 8 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 18.0.2.199 of Intel C/C++  
- **Compiler for Linux:** Fortran: Version 18.0.2.199 of Intel Fortran  
- **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 V5.0.1

### SPECrate Results

<table>
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<tr>
<th>Test</th>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
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Results Table

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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 i7-6700K 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.
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.
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:
Power Management Policy: Custom
Energy Performance: Performance
DCU Streamer Prefetcher: Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bced8f2999c33d61f64985e45859ea9
running on t110is Fri Nov 9 11:50:42 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) Xeon(R) CPU E3-1230 v6 @ 3.50GHz
  1 "physical id"s (chips)
  8 "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 : 4
siblings : 8
physical 0: cores 0 1 2 3

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 2
Core(s) per socket: 4
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) CPU E3-1230 v6 @ 3.50GHz
Stepping: 9
CPU MHz: 3890.195
CPU max MHz: 3900.0000
NEC Corporation

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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: 8192K
- NUMA node0 CPU(s): 0-7
- Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpeslgb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagersfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpcr pdcz pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsvav avx f16c rdrand lahf_lm abm 3dnowprefetch epb invpcid_single intel_prt spec_ctrl ibpb_support tpr_shadow vnmi flexpriority ept vpid fsqsgbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1 dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp

/proc/cpuinfo cache data
- cache size: 8192 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 4 5 6 7
- node 0 size: 65473 MB
- node 0 free: 63612 MB
- node distances:
  - node 0: 0
- 10

From /proc/meminfo
- MemTotal: 65914328 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)

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**Platform Notes (Continued)**

- system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)

```
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
```

Kernel self-reported vulnerability status:

- CVE-2017-5754 (Meltdown): Mitigation: PTI
- CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences
- CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Nov 9 11:45

SPEC is set to: /home/cpu2017

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext4  909G  119G  744G  14% /
```

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) 525.x264_r(base) 557.xz_r(base) ==

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

== CC 500.perlbench_r(peak) 502.gcc_r(peak) 505.mcf_r(peak) 525.x264_r(peak) 557.xz_r(peak) ==

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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**Compiler Version Notes (Continued)**

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

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

```plaintext
FC 548.exchange2_r(base)
```

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

```plaintext
FC 548.exchange2_r(peak)
```

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

**Base Compiler Invocation**

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

- **C++ benchmarks:**
  - icpc -m64

- **Fortran benchmarks:**
  - ifort -m64
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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 -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-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/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

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

523.xalancbmk_r.icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64
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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

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Peak Optimization Flags (Continued)

541.leela_r (continued):
-L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:

548.exchange2_r: basepeak = yes

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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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

Tested with SPEC CPU2017 v1.0.5 on 2018-11-08 21:50:41-0500.
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