## NEC Corporation

**Express5800/R110i-1 (Intel Xeon E3-1240L v5)**

### SPECrate2017_fp_base = 23.2

### SPECrate2017_fp_peak = 23.6

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<th>Test Date</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
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<tr>
<td>Oct-2018</td>
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### Copies

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<td>8</td>
<td>554.roms_r</td>
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### Hardware

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<tr>
<th>CPU Name</th>
<th>Intel Xeon E3-1240L v5</th>
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<tr>
<td>Max MHz.</td>
<td>3200</td>
</tr>
<tr>
<td>Nominal</td>
<td>2100</td>
</tr>
<tr>
<td>Enabled</td>
<td>4 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1 chip</td>
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<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
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<td>L2:</td>
<td>256 KB I+D on chip per core</td>
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<td>L3:</td>
<td>8 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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<tr>
<td>Memory:</td>
<td>64 GB (4 x 16 GB 2Rx8 PC4-2400T-E, running at 2133)</td>
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<tr>
<td>Storage:</td>
<td>1 x 1 TB SATA, 7200 RPM</td>
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<td>Other:</td>
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### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>Red Hat Enterprise Linux Server 7.4 (Maipo)</th>
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<tr>
<td>Compiler:</td>
<td>C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux</td>
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<td>Parallel:</td>
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<td>Firmware:</td>
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<td>File System:</td>
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<td>System State:</td>
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<td>Other:</td>
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SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R110i-1 (Intel Xeon E3-1240L v5)

SPECrate2017_fp_base = 23.2
SPECrate2017_fp_peak = 23.6

Table: Results

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</tbody>
</table>

SPECrate2017_fp_base = 23.2
SPECrate2017_fp_peak = 23.6

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/jes5.0.1-32:/home/cpu2017/jes5.0.1-64"

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.

(Continued on next page)
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:
  Power Management Policy: Custom
  Energy Performance: Performance
  DCU Streamer Prefetcher: Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on r11011 Mon Oct 22 21:28:37 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 E3-1240L v5 @ 2.10GHz
  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: 94
  Model name: Intel(R) Xeon(R) CPU E3-1240L v5 @ 2.10GHz
  Stepping: 3
  CPU MHz: 2897.835

(Continued on next page)
NEC Corporation

Express5800/R110i-1 (Intel Xeon E3-1240L v5)

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

SPECrate2017_fp_base = 23.2
SPECrate2017_fp_peak = 23.6

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

Platform Notes (Continued)

CPU max MHz: 3200.0000
CPU min MHz: 800.0000
BogoMIPS: 4224.00
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 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
a perfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch epb invpcid_single intel_pt spec_ctrl
ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1
dtherm ida arat pin pts hwp hwp_notify hwp_act_window hwp_epp

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.

From /proc/cpuinfo cache data

From /proc/meminfo

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)"

(Continued on next page)
NEC Corporation

Express5800/R110i-1 (Intel Xeon E3-1240L v5)

SPEC CPU2017 Floating Point Rate Result

SPECrate2017_fp_base = 23.2
SPECrate2017_fp_peak = 23.6

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)

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

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 Oct 22 21:22

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext4  909G   87G  776G  11% /

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, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

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<tr>
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(Continued on next page)
NEC Corporation

Express5800/R110i-1 (Intel Xeon E3-1240L v5)

SPECrate2017_fp_base = 23.2
SPECrate2017_fp_peak = 23.6

Compiler Version Notes (Continued)

==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base, peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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==============================================================================
CXXC 508.namd_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC  511.povray_r(base) 526.blender_r(base, peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC   511.povray_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
FC  507.cactuBSSN_r(base, peak)
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icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210

(Continued on next page)
NEC Corporation
Express5800/R110i-1 (Intel Xeon E3-1240L v5)

SPECraten2017_fp_base = 23.2
SPECraten2017_fp_peak = 23.6

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

---

Compiler Version Notes (Continued)

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 554.roms_r(peak)

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

CC 521.wrf_r(base) 527.cam4_r(base)

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

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

CC 521.wrf_r(peak) 527.cam4_r(peak)

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

icc (ICC) 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

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

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

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

NEC Corporation
Express5800/R110i-1 (Intel Xeon E3-1240L v5)

SPECrate2017_fp_base = 23.2
SPECrate2017_fp_peak = 23.6

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

Base Compiler Invocation (Continued)

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.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
527.cam4_r: -DSPEC_LP64 -DSPEC_LP64
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:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

(Continued on next page)
**Base Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++:
- `xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-qopt-prefetch` `-ffinite-math-only`
- `-qopt-mem-layout-trans=3` `-auto` `-nostandard-realloc-lhs`

---

**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`

---

**Peak Portability Flags**

Same as Base Portability Flags

---

**Peak Optimization Flags**

- **C benchmarks:**
  - `519.lbm_r` `-prof-gen(pass 1)` `-prof-use(pass 2)` `-ipo` `-xCORE-AVX2` `-O3`
  - `-no-prec-div` `-qopt-prefetch` `-ffinite-math-only`
  - `-qopt-mem-layout-trans=3`

  - `538.imagick_r` `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-qopt-prefetch`
  - `-ffinite-math-only` `-qopt-mem-layout-trans=3`
Peak Optimization Flags (Continued)

544.nab_r: Same as 538.imagick_r

C++ benchmarks:

508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -auto
-nostandard-realloc-lhs

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
### NEC Corporation

Express5800/R110i-1 (Intel Xeon E3-1240L v5)

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


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Tested with SPEC CPU2017 v1.0.5 on 2018-10-22 08:28:36-0400.