## NEC Corporation

Express5800/R120h-1M (Intel Xeon Silver 4210R)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 121</th>
<th>SPECrate®2017_fp_peak = 127</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 9006</td>
<td>Test Date: Jul-2020</td>
</tr>
<tr>
<td>Test Sponsor: NEC Corporation</td>
<td>Hardware Availability: May-2020</td>
</tr>
<tr>
<td>Tested by: NEC Corporation</td>
<td>Software Availability: Sep-2019</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Silver 4210R
- **Max MHz:** 3200
- **Nominal:** 2400
- **Enabled:** 20 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 13.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2400)
- **Storage:** 1 x 1 TB SATA, 7200 RPM, RAID 0
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.7 (Maipo)
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux;
  Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux
- **Parallel:** No
- **Firmware:** NEC BIOS Version U32 v2.32 03/09/2020 released Jun-2020
- **File System:** ext4
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage.

---

| Benchmark | Copies | 0 | 15.0 | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 | 330 | 340 |
|-----------|--------|---|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 503.bwaves_r | 40     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 507.caCTuBSSN_r | 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 508.namd_r | 40    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 510.parest_r | 40   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 511.povray_r | 40     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 519.lbm_r | 40     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 521.wrf_r | 40     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 526.blender_r | 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 527.cam4_r | 40     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 538.imagick_r | 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 544.nab_r | 40    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 549.fotonik3d_r | 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 554.roms_r | 40     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

---

**SPECrate®2017_fp_base (121)**

**SPECrate®2017_fp_peak (127)**

---

**507.caCTuBSSN_r**

**511.povray_r**

**519.lbm_r**

**521.wrf_r**

**526.blender_r**

**527.cam4_r**

**538.imagick_r**

**544.nab_r**

**549.fotonik3d_r**

**554.roms_r**
PEC CPU®2017 Floating Point Rate Result

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

NEC Corporation

Express5800/R120h-1M (Intel Xeon Silver 4210R)

Copyright 2017-2020 Standard Performance Evaluation Corporation

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>40</td>
<td>1206</td>
<td>333</td>
<td>1206</td>
<td>333</td>
<td>1203</td>
<td>333</td>
<td>20</td>
<td>592</td>
<td>339</td>
<td>593</td>
<td>338</td>
<td>593</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>40</td>
<td>530</td>
<td>95.5</td>
<td>529</td>
<td>95.6</td>
<td>529</td>
<td>95.7</td>
<td>40</td>
<td>530</td>
<td>95.5</td>
<td>529</td>
<td>95.6</td>
<td>529</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>40</td>
<td>450</td>
<td>84.5</td>
<td>451</td>
<td>84.2</td>
<td>453</td>
<td>83.9</td>
<td>40</td>
<td>452</td>
<td>84.2</td>
<td>450</td>
<td>84.4</td>
<td>451</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>40</td>
<td>1624</td>
<td>64.4</td>
<td>1624</td>
<td>64.4</td>
<td>1631</td>
<td>64.1</td>
<td>20</td>
<td>734</td>
<td>71.3</td>
<td>735</td>
<td>71.2</td>
<td>735</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>40</td>
<td>726</td>
<td>129</td>
<td>726</td>
<td>129</td>
<td>730</td>
<td>128</td>
<td>40</td>
<td>598</td>
<td>156</td>
<td>598</td>
<td>156</td>
<td>596</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>40</td>
<td>523</td>
<td>80.6</td>
<td>523</td>
<td>80.5</td>
<td>525</td>
<td>80.3</td>
<td>40</td>
<td>494</td>
<td>85.4</td>
<td>494</td>
<td>85.4</td>
<td>492</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>40</td>
<td>612</td>
<td>146</td>
<td>612</td>
<td>146</td>
<td>610</td>
<td>147</td>
<td>40</td>
<td>612</td>
<td>146</td>
<td>612</td>
<td>146</td>
<td>610</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>40</td>
<td>541</td>
<td>113</td>
<td>540</td>
<td>113</td>
<td>541</td>
<td>113</td>
<td>40</td>
<td>541</td>
<td>113</td>
<td>540</td>
<td>113</td>
<td>541</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>40</td>
<td>592</td>
<td>118</td>
<td>596</td>
<td>117</td>
<td>596</td>
<td>117</td>
<td>40</td>
<td>569</td>
<td>123</td>
<td>568</td>
<td>123</td>
<td>568</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>40</td>
<td>378</td>
<td>263</td>
<td>378</td>
<td>263</td>
<td>377</td>
<td>264</td>
<td>40</td>
<td>378</td>
<td>263</td>
<td>378</td>
<td>263</td>
<td>378</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>40</td>
<td>361</td>
<td>186</td>
<td>362</td>
<td>186</td>
<td>362</td>
<td>186</td>
<td>40</td>
<td>360</td>
<td>187</td>
<td>362</td>
<td>186</td>
<td>365</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>40</td>
<td>1351</td>
<td>115</td>
<td>1346</td>
<td>116</td>
<td>1360</td>
<td>115</td>
<td>40</td>
<td>1348</td>
<td>116</td>
<td>1348</td>
<td>116</td>
<td>1345</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>40</td>
<td>1063</td>
<td>59.8</td>
<td>1065</td>
<td>59.7</td>
<td>1064</td>
<td>59.8</td>
<td>20</td>
<td>436</td>
<td>72.9</td>
<td>436</td>
<td>72.8</td>
<td>437</td>
</tr>
</tbody>
</table>

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X 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
runcpu command invoked through numactl i.e.:

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

NEC Corporation
Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

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

Test Date: Jul-2020
Hardware Availability: May-2020
Software Availability: Sep-2019

General Notes (Continued)

numactl --interleave=all runcpu <etc>

NA: 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.

Platform Notes

BIOS Settings:
Thermal Configuration: Maximum Cooling
Workload Profile: General Throughput Compute
Memory Patrol Scrubbing: Disabled
LLC Dead Line Allocation: Disabled
LLC Prefetch: Enabled
Enhanced Processor Performance: Enabled
Workload Profile: Custom
Advanced Memory Protection: Advanced ECC Support
Sub-NUMA Clustering: Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7eddb1e6e46a485a001
running on r120h1m Fri Jul 10 18:50:25 2020

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) Silver 4210R CPU @ 2.40GHz
  2 "physical id"s (chips)
  40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result  
Copyright 2017-2020 Standard Performance Evaluation Corporation

NEC Corporation
Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

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

Test Date: Jul-2020
Hardware Availability: May-2020
Software Availability: Sep-2019

Platform Notes (Continued)

CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4210R CPU @ 2.40GHz
Stepping: 7
CPU MHz: 2400.000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
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 smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3nowprefetch ebp cat_13 cdp_13 invvpcl_single
intel_pmin intel_pt ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmm
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw
avx512vl xsaveopt xsavec xgetbv1 cqm_1lc cqm_occup_1lc cqm_mbm_total cqm_mbm_local
dtherm ida arat pin pts pku ospke avx512_vnni md_clear spec_ctrl intel_stibp
flush_l1d arch_capabilities

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
node 0 size: 196265 MB
node 0 free: 191560 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
node 1 size: 196607 MB
node 1 free: 192152 MB
node distances:
node 0 1

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

Copyright 2017-2020 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrater®2017_fp_base = 121
SPECrater®2017_fp_peak = 127

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

Test Date: Jul-2020
Hardware Availability: May-2020
Software Availability: Sep-2019

Platform Notes (Continued)

0:  10  21
1:  21  10

From /proc/meminfo
MemTotal:       395923400 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*

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

uname -a:
Linux r120h1m 3.10.0-1062.1.1.el7.x86_64 #1 SMP Tue Aug 13 18:39:59 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault):        Not affected
Microarchitectural Data Sampling:        Not affected
CVE-2017-5754 (Meltdown):                Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
                                           via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):        Mitigation: Load fences, userscopy/swapps
                                           barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):        Mitigation: Full retpoline, IBPB

run-level 3 Jul 10 18:44

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext4  908G  179G  683G  21% /

From /sys/devices/virtual/dmi/id
BIOS:          NEC U32 03/09/2020
Vendor:        NEC
Product:       Express5800/R120h-1M

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

NEC Corporation
Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

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

Serial: JPN0084094

Platform Notes (Continued)

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.

Memory:
24x HPE P03050-091 16 GB 2 rank 2933

(End of data from sysinfo program)

Regarding the sysinfo display about the memory speed, the correct configured memory speed is 2400 MT/s. The dmidecode description should be as follows:
24x HPE P03050-091 16 GB 2 rank 2933, configured at 2400

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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

C++, C
| 511.povray_r(base, peak) 526.blender_r(base, peak)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

C++, C, Fortran
| 507.cactuBSSN_r(base, peak)

(Continued on next page)
NEC Corporation

Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Test Date: Jul-2020
Tested by: NEC Corporation
Hardware Availability: May-2020
Software Availability: Sep-2019

---

Compiler Version Notes (Continued)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

---

Fortran
503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
554.roms_r(base, peak)

---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

---

Fortran, C
521.wrf_r(base, peak) 527.cam4_r(base, peak)

---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

---

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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

(Continued on next page)
**Base Compiler Invocation (Continued)**

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

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

**Base Portability Flags**

- `503.bwaves_r`: `-DSPEC_LP64`
- `507.cactusBSSN_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_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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte
```
NEC Corporation
Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrate®2017_fp_base = 121
SPECrate®2017_fp_peak = 127

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

Test Date: Jul-2020
Hardware Availability: May-2020
Software Availability: Sep-2019

Base Optimization Flags (Continued)

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -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

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=4

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

Copyright 2017-2020 Standard Performance Evaluation Corporation

NEC Corporation

Express5800/R120h-1M (Intel Xeon Silver 4210R)

SPECrate®2017_fp_peak = 127
SPECrate®2017_fp_base = 121

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Test Date: Jul-2020
Tested by: NEC Corporation
Hardware Availability: May-2020
Software Availability: Sep-2019

Peak Optimization Flags (Continued)

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

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=4

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -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 -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_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=4 -auto -nostandard-realloc-lhs -align array32byte

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=4

526.blender_r: basepeak = yes

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

NEC Corporation
Express5800/R120h-1M (Intel Xeon Silver 4210R)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 121</th>
<th>SPECrate®2017_fp_peak = 127</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 9006</td>
<td>Test Date: Jul-2020</td>
</tr>
<tr>
<td>Test Sponsor: NEC Corporation</td>
<td>Hardware Availability: May-2020</td>
</tr>
<tr>
<td>Tested by: NEC Corporation</td>
<td>Software Availability: Sep-2019</td>
</tr>
</tbody>
</table>

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevE.xml

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.0 on 2020-07-10 05:50:24-0400.
Originally published on 2020-09-01.