# NEC Corporation

**Express5800/D120h (Intel Xeon Bronze 3104)**

**SPECrater2017_fp_base = 23.0**

**SPECrater2017_fp_peak = 23.6**

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## Hardware

**CPU Name:** Intel Xeon Bronze 3104  
**Max MHz.:** 1700  
**Nominal:** 1700  
**Enabled:** 6 cores, 1 chip  
**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:** 8.25 MB I+D on chip per chip  
**Other:** None  
**Memory:** 192 GB (6 x 32 GB 2Rx4 PC4-2666V-R, running at 2133)  
**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 F21 02/22/2018 released Apr-2018  
**File System:** ext4  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** None
NEC Corporation

Express5800/D120h (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 23.0

SPECrate2017_fp_peak = 23.6

### Results Table

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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/jem5.0.1-32:/home/cpu2017/jem5.0.1-64"
```

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
```

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)
SPEC CPU2017 Floating Point Rate Result

NEC Corporation

Express5800/D120h (Intel Xeon Bronze 3104)  

SPECrates2017_fp_base = 23.0  
SPECrates2017_fp_peak = 23.6

CPU2017 License: 9006  
Test Sponsor: NEC Corporation  
Test Date: Aug-2018  
Hardware Availability: Jan-2018  
Tested by: NEC Corporation  
Software Availability: Mar-2018

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:
ENERGY_PERF_BIAS_CFG mode: Performance  
LLC dead line alloc: Disable  
Patrol Scrub: Disable  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b8c90f  
running on d120h Tue Aug 7 17:49:58 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

1 model name : Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz
1 1 "physical id"s (chips)
6 6 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5

From lscpu:

Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 6  
On-line CPU(s) list: 0-5  
Thread(s) per core: 1  
Core(s) per socket: 6  
Socket(s): 1  
NUMA node(s): 1  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz  
Stepping: 4  
CPU MHz: 1697.410  
CPU max MHz: 1700.0000

(Continued on next page)
## NEC Corporation

**NEC Corporation**

**Express5800/D120h (Intel Xeon Bronze 3104)**

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<thead>
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### Platform Notes (Continued)

- **CPU min MHz:** 800.0000
- **BogoMIPS:** 3400.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 8448K
- **NUMA node0 CPU(s):** 0-5
- **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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch pb秸 cat_13 cd p cqm_single intel_pt spec_ctrl ibpb_support tpr_shadow vnmi 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 cqms_cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm arat pln pts hwp hwp_act_window hwp_pkg_req

/proc/cpuinfo cache data

```
cache size : 8448 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
node 0 size: 195236 MB
node 0 free: 190158 MB
node distances:
node   0
0:  10
```

**From /proc/meminfo**

```
MemTotal:       196476496 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"
```

(Continued on next page)
NEC Corporation

Express5800/D120h (Intel Xeon Bronze 3104)

**SPEC CPU2017 Floating Point Rate Result**

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**SPECrate2017_fp_base** = 23.0

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Platform Notes (Continued)

PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
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 d120h 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 Aug 7 17:44

SPEC is set to: /home/cpu2017

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 GIGABYTE F21 02/22/2018
Memory:
10x NO DIMM NO DIMM
6x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base) |
|==============================================================================|
| icc (ICC) 18.0.0 20170811 |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
|==============================================================================|

==============================================================================
| CC  519.lbm_r(peak) 544.nab_r(peak) |
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| icc (ICC) 18.0.0 20170811 |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
|==============================================================================|

==============================================================================
| CXXC 508.namd_r(base) 510.parest_r(base) |
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| icpc (ICC) 18.0.0 20170811 |

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Software Availability: Mar-2018

### Compiler Version Notes (Continued)

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icpc (ICC) 18.0.0 20170811  
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Express5800/D120h (Intel Xeon Bronze 3104)

SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

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Compiler Version Notes (Continued)

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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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**SPEC CPU2017 Floating Point Rate Result**

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

### Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
- `ifort icc`

Benchmarks using both C and C++:
- `icpc icc`

Benchmarks using Fortran, C, and C++:
- `icpc icc ifort`

### 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_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 -03 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3`

**C++ benchmarks:**
- `-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3`

**Fortran benchmarks:**
- `-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

Benchmarks using both Fortran and C:
- `-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

(Continued on next page)
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=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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

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

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
PEC CPU2017 Floating Point Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

NEC Corporation
Express5800/D120h (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 23.0
SPECrate2017_fp_peak = 23.6

CPU2017 License: 9006
Test Sponsor: NEC Corporation
Test Date: Aug-2018
Tested by: NEC Corporation
Hardware Availability: Jan-2018
Software Availability: Mar-2018

Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes
544.nab_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

C++ benchmarks:
-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

Fortran benchmarks:
503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3
-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=3 -nostandard-realloc-lhs
-align array32byte

(Continued on next page)
NEC Corporation

Express5800/D120h (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 23.0
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CPU2017 License: 9006
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Tested by: NEC Corporation
Hardware Availability: Jan-2018
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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_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 -nostandard-realloc-lhs
-align array32byte

527.cam4_r: basepeak = yes

Benchmarks using both C 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

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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

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

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

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-D120h-RevA.html
### SPEC CPU2017 Floating Point Rate Result

**NEC Corporation**

**Express5800/D120h (Intel Xeon Bronze 3104)**

<table>
<thead>
<tr>
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- **CPU2017 License:** 9006
- **Test Sponsor:** NEC Corporation
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You can also download the XML flags sources by saving the following links:

- [NEC-Platform-Settings-V1.2-D120h-RevA.xml](http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-D120h-RevA.xml)

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

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