**NEC Corporation**

**Express5800/R120h-1M (Intel Xeon Platinum 8268)**

| SPECspeed<sup>®</sup>2017_int_base = 10.0 | SPECspeed<sup>®</sup>2017_int_peak = 10.2 |

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<th>CPU2017 License: 9006</th>
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<td>Hardware Availability: Dec-2019</td>
</tr>
<tr>
<td>Tested by: NEC Corporation</td>
<td>Software Availability: Sep-2019</td>
</tr>
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### Software
- **OS:** Red Hat Enterprise Linux Server release 7.7 (Maipo)  
  Kernel 3.10.0-1062.1.1.el7.x86_64
- **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:** Yes
- **Firmware:** NEC BIOS Version U32 v2.22 11/13/2019 released Mar-2020
- **File System:** ext4
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** jemalloc memory allocator V5.0.1
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage.

### Hardware
- **CPU Name:** Intel Xeon Platinum 8268
- **Max MHz:** 3900
- **Nominal:** 2900
- **Enabled:** 48 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:** 35.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)
- **Storage:** 1 x 1 TB SATA, 7200 RPM, RAID 0
- **Other:** None

### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed&lt;sup&gt;®&lt;/sup&gt;2017_int_base (10.0)</th>
<th>SPECspeed&lt;sup&gt;®&lt;/sup&gt;2017_int_peak (10.2)</th>
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<tr>
<td>perlbench_s</td>
<td>96</td>
<td>7.33</td>
<td>10.2</td>
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<tr>
<td>gcc_s</td>
<td>96</td>
<td>9.30</td>
<td>10.0</td>
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<td>mcf_s</td>
<td>96</td>
<td>12.0</td>
<td>11.9</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>96</td>
<td>9.01</td>
<td>12.1</td>
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<tr>
<td>xalancbmk_s</td>
<td>96</td>
<td>11.9</td>
<td>14.4</td>
</tr>
<tr>
<td>x264_s</td>
<td>96</td>
<td>14.4</td>
<td>14.4</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>96</td>
<td>5.37</td>
<td>5.38</td>
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<td>leela_s</td>
<td>96</td>
<td>4.56</td>
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<tr>
<td>exchange2_s</td>
<td>96</td>
<td>15.6</td>
<td>15.6</td>
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<tr>
<td>xz_s</td>
<td>96</td>
<td>24.1</td>
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### Notes
- **Environment:** NEC Corporation
- **System State:** Run level 3 (multi-user)
## Results Table

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<th>Benchmark</th>
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<td>6.43</td>
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<td>256</td>
<td>24.1</td>
<td>256</td>
<td>23.8</td>
</tr>
</tbody>
</table>

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### 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:

- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
- OMP_STACKSIZE = "192M"

### 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
```

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.

jemalloc, a general purpose malloc implementation
SPEC CPU®2017 Integer Speed Result

NEC Corporation

Express5800/R120h-1M (Intel Xeon Platinum 8268)

SPECspeed®2017_int_base = 10.0
SPECspeed®2017_int_peak = 10.2

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

Test Date: Jun-2020
Hardware Availability: Dec-2019
Software Availability: Sep-2019

General Notes (Continued)

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS Settings:
Thermal Configuration: Maximum Cooling
Workload Profile: General Peak Frequency 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
NUMA Group Size Optimization: Flat

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed61e6e46a485a0011
running on r120h1m Wed Jun 24 18:00:33 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) Platinum 8268 CPU @ 2.90GHz
  2 "physical id"s (chips)
    96 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel

(Continued on next page)
Platform Notes (Continued)

CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8268 CPU @ 2.90GHz
Stepping: 6
CPU MHz: 2900.000
BogoMIPS: 5800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-23,48-71
NUMA node1 CPU(s): 24-47,72-95
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dct acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good ntopx nonstop_tsc aperfmpref eagercpu 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 rdrcd lahf_lm abm 3dnowprefetch ebpf cat13 cdp13 invpcid_single intel_pgp the pms intel_pt ssbd mba ibrs ibpb stibp ibrs enhanced prr_shadow vmni flexpriority et vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmip mx dtp a avx512f avx512dq rdrcd adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsave xgetbv1 cmq_l1c cmq_occmap_l1c cmq_mbm_total cmq_mbm_local dtherm ida arat pin pts pku ospke avx512_vnni md_clear spec_ctrl intel_stibp flush_lld arch_capabilities

/proc/cpuinfo cache data
  cache size: 36608 KB

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 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
  node 0 size: 196264 MB
  node 0 free: 191461 MB
  node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
  node 1 size: 196607 MB
  node 1 free: 192031 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395914376 KB

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

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Test Date: Jun-2020
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Software Availability: Sep-2019

Platform Notes (Continued)

HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
    os-release:
        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, usercopy/swapgs
    barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):        Mitigation: Full retpoline, IBPB

run-level 3 Jun 24 17:54

SPEC is set to: /home/cpu2017
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext4  908G  159G  704G  19% /

From /sys/devices/virtual/dmi/id
    BIOS:  NEC U32 11/13/2019
    Vendor: NEC
    Product: Express5800/R120h-1M
    Serial: JPN0084094

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

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**

**NEC Corporation**

**Express5800/R120h-1M (Intel Xeon Platinum 8268)**

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**SPECspeed®2017_int_base = 10.0**

**SPECspeed®2017_int_peak = 10.2**

---

**Platform Notes (Continued)**

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)

---

**Compiler Version Notes**

---

**C benchmarks**

icc -m64 -std=c11

**C++ benchmarks**

icpc -m64

**Fortran benchmarks**

ifort -m64

---

**Base Compiler Invocation**

C benchmarks:

icc -m64 -std=c11

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64
SPEC CPU®2017 Integer Speed Result

NEC Corporation

Express5800/R120h-1M (Intel Xeon Platinum 8268)

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Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64
SPEC CPU®2017 Integer Speed Result

**NEC Corporation**

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**SPECspeed®2017_int_base = 10.0**

**SPECspeed®2017_int_peak = 10.2**

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**

- **600.perlbench_s:** `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -fno-strict-overflow
-//usr/local/je5.0.1-64/lib -ljemalloc`

- **602.gcc_s:** `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP
-//usr/local/je5.0.1-64/lib -ljemalloc`

- **605.mcf_s:** `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-//usr/local/je5.0.1-64/lib -ljemalloc`

- **625.x264_s:** `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-//usr/local/je5.0.1-64/lib -ljemalloc`

- **657.xz_s:** `basepeak = yes`

**C++ benchmarks:**

- **620.omnetpp_s:** `basepeak = yes`

- **623.xalancbmk_s:** `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-//usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc`

- **631.deepsjeng_s:** `Same as 623.xalancbmk_s`

- **641.leela_s:** `Same as 623.xalancbmk_s`

**Fortran benchmarks:**

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs`
NEC Corporation

Express5800/R120h-1M (Intel Xeon Platinum 8268)

SPECspeed®2017_int_base = 10.0
SPECspeed®2017_int_peak = 10.2

CPU2017 License: 9006
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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

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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 2020-06-24 05:00:33-0400.
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