**NEC Corporation**

**Express5800/T110i-S (Intel Xeon E3-1220 v6)**

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>NEC Corporation</th>
<th>Software Availability</th>
<th>Apr-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by</td>
<td>NEC Corporation</td>
<td>Hardware Availability</td>
<td>Mar-2018</td>
</tr>
<tr>
<td>CPU2017 License</td>
<td>9006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Date</td>
<td>Nov-2018</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECspeed2017 int_base = 7.66**

**SPECspeed2017 int_peak = 7.97**

**CPU Name:** Intel Xeon E3-1220 v6  
**Max MHz.:** 3500  
**Nominal:** 3000  
**Enabled:** 4 cores, 1 chip  
**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

**OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)  
**Kernel:** 3.10.0-693.21.1.el7.x86_64  
**Compiler:** C/C++: Version 18.0.2.199 of Intel C/C++  
**Compiler for Linux:** Fortran: Version 18.0.2.199 of Intel Fortran  
**Parallel:** Yes  
**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
NEC Corporation

Express5800/T110i-S (Intel Xeon E3-1220 v6)

SPEC CPU2017 Integer Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 7.66

SPECspeed2017_int_peak = 7.97

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>4</td>
<td>320</td>
<td>5.54</td>
<td>319</td>
<td>5.56</td>
<td>318</td>
<td>5.59</td>
<td>4</td>
<td>265</td>
<td>6.70</td>
<td>262</td>
<td>6.77</td>
<td>262</td>
<td>6.77</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>4</td>
<td>397</td>
<td>11.9</td>
<td>398</td>
<td>11.9</td>
<td>403</td>
<td>11.7</td>
<td>4</td>
<td>397</td>
<td>11.9</td>
<td>398</td>
<td>11.9</td>
<td>403</td>
<td>11.7</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>4</td>
<td>295</td>
<td>5.54</td>
<td>295</td>
<td>5.53</td>
<td>307</td>
<td>5.31</td>
<td>4</td>
<td>292</td>
<td>5.58</td>
<td>290</td>
<td>5.62</td>
<td>290</td>
<td>5.62</td>
</tr>
<tr>
<td>623.xalancmk_s</td>
<td>4</td>
<td>156</td>
<td>9.10</td>
<td>156</td>
<td>9.10</td>
<td>157</td>
<td>9.02</td>
<td>4</td>
<td>136</td>
<td>10.4</td>
<td>137</td>
<td>10.4</td>
<td>138</td>
<td>10.3</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>4</td>
<td>163</td>
<td>10.8</td>
<td>163</td>
<td>10.8</td>
<td>163</td>
<td>10.8</td>
<td>4</td>
<td>162</td>
<td>10.9</td>
<td>162</td>
<td>10.9</td>
<td>162</td>
<td>10.9</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>4</td>
<td>277</td>
<td>5.17</td>
<td>277</td>
<td>5.17</td>
<td>277</td>
<td>5.17</td>
<td>4</td>
<td>277</td>
<td>5.17</td>
<td>277</td>
<td>5.17</td>
<td>277</td>
<td>5.17</td>
</tr>
<tr>
<td>641.leea_s</td>
<td>4</td>
<td>419</td>
<td>4.08</td>
<td>419</td>
<td>4.07</td>
<td>418</td>
<td>4.08</td>
<td>4</td>
<td>419</td>
<td>4.08</td>
<td>419</td>
<td>4.07</td>
<td>418</td>
<td>4.08</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>4</td>
<td>234</td>
<td>12.6</td>
<td>231</td>
<td>12.7</td>
<td>232</td>
<td>12.7</td>
<td>4</td>
<td>231</td>
<td>12.7</td>
<td>230</td>
<td>12.8</td>
<td>231</td>
<td>12.7</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>4</td>
<td>805</td>
<td>7.68</td>
<td>805</td>
<td>7.68</td>
<td>805</td>
<td>7.68</td>
<td>4</td>
<td>780</td>
<td>7.93</td>
<td>780</td>
<td>7.93</td>
<td>780</td>
<td>7.93</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base = 7.66

SPECspeed2017_int_peak = 7.97

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

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

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.

SPEC CPU2017 Integer Speed Result

NEC Corporation
Express5800/T110i-S (Intel Xeon E3-1220 v6)

SPECspeed2017_int_base = 7.66
SPECspeed2017_int_peak = 7.97

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

Platform Notes

BIOS Settings:
  Power Management Policy: Custom
  Energy Performance: Performance
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on t110is Tue Nov 6 09:31:27 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 E3-1220 v6 @ 3.00GHz
  1 "physical id"s (chips)
  4 "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 : 4
  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): 4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
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 E3-1220 v6 @ 3.00GHz
Stepping: 9
CPU MHz: 3316.757
CPU max MHz: 3500.0000
CPU min MHz: 800.0000
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-3
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)
SPEC CPU2017 Integer Speed Result

NEC Corporation

Express5800/T110i-S (Intel Xeon E3-1220 v6)

SPECspeed2017_int_base = 7.66
SPECspeed2017_int_peak = 7.97

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

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

Platform Notes (Continued)

pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpellgb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref eagerfpu pni pclmulqdq dtel64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xtrm pdcm pcd 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
ibp支持 tpr_shadow fpmi flexpriority ept vpid fsgsbases 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

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
node 0 size: 65474 MB
node 0 free: 63623 MB
node distances:
node 0
0: 10

From /proc/meminfo
MemTotal: 65915028 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)
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 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:

(Continued on next page)
SPEC CPU2017 Integer Speed Result

NEC Corporation

Express5800/T110i-S (Intel Xeon E3-1220 v6)

SPECspeed2017_int_base = 7.66
SPECspeed2017_int_peak = 7.97

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

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

Platform Notes (Continued)

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 6 09:25

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>ext4</td>
<td>909G</td>
<td>116G</td>
<td>747G</td>
<td>14%</td>
<td>/</td>
</tr>
</tbody>
</table>

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  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base, peak) 657.xz_s(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC  600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

(Continued on next page)
NEC Corporation

Express5800/T110i-S (Intel Xeon E3-1220 v6)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.66</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>7.97</td>
</tr>
</tbody>
</table>

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

Compiler Version Notes (Continued)

```plaintext
CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak) 641.leela_s(peak)
icpc (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

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
```
### SPEC CPU2017 Integer Speed Result

#### NEC Corporation

**Express5800/T110i-S (Intel Xeon E3-1220 v6)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.66</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>7.97</td>
</tr>
</tbody>
</table>

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

**Test Date:** Nov-2018  
**Hardware Availability:** Apr-2017  
**Software Availability:** Mar-2018

### Base Optimization Flags

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

- **C++ benchmarks:**
  - `-Wl,-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:**
  - `-Wl,-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:**
  - `icc -m64 -std=c11`

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

- **623.xalancbmk_s:**
  - `icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin`

- **Fortran benchmarks:**
  - `ifort -m64`

### Peak Portability Flags

- **600.perlbench_s:** `-DSPEC_LP64`  
  `-DSPEC_LINUX_X64`

- **602.gcc_s:** `-DSPEC_LP64`

- **605.mcf_s:** `-DSPEC_LP64`

- **620.ommnetpp_s:** `-DSPEC_LP64`

- **623.xalancbmk_s:**
  - `-D_FILE_OFFSET_BITS=64`  
  `-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`
# SPEC CPU2017 Integer Speed Result

## NEC Corporation

**Express5800/T110i-S (Intel Xeon E3-1220 v6)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.66</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>7.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>NEC Corporation</td>
</tr>
<tr>
<td>Tested by:</td>
<td>NEC Corporation</td>
</tr>
</tbody>
</table>

### Peak Optimization Flags

#### C benchmarks:

600.perlbench_s: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc`

602.gcc_s: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc`

605.mcf_s: `basepeak = yes`

625.x264_s: `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

657.xz_s: Same as 602.gcc_s

#### C++ benchmarks:

620.omnetpp_s: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

623.xalancbmk_s: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-32/lib -ljemalloc`

631.deepsjeng_s: `basepeak = yes`

641.leela_s: `basepeak = yes`

#### Fortran benchmarks:

`-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-L/usr/local/je5.0.1-64/lib -ljemalloc`
### NEC Corporation

**Express5800/T110i-S (Intel Xeon E3-1220 v6)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.66</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>7.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>9006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor</td>
<td>NEC Corporation</td>
</tr>
<tr>
<td>Tested by</td>
<td>NEC Corporation</td>
</tr>
</tbody>
</table>

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

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:


---

SPEC is a registered trademark 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 CPU2017 v1.0.5 on 2018-11-05 19:31:26-0500.  
Originally published on 2018-11-27.