# SPEC® CPU2017 Floating Point Rate Result

## Dell Inc.

**PowerEdge T440 (Intel Xeon Bronze 3104, 1.70 GHz)**

<table>
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<tr>
<th>SOFTWARE</th>
<th>SPECrate2017_fp_base</th>
<th>SPECrate2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45.3</td>
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<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>55</th>
<th>Test Date:</th>
<th>Oct-2017</th>
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</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
<td>Hardware Availability:</td>
<td>Sep-2017</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Software Availability:</td>
<td>Sep-2017</td>
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</tbody>
</table>

## Hardware

**CPU Name:** Intel Xeon Bronze 3104

- **Max MHz.:** 1700
- **Nominal:** 1700
- **Enabled:** 12 cores, 2 chips
- **Orderable:** 1,2 chip
- **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 (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2133)

**Storage:** 480 GB SATA SSD

**Other:** None

## Software

**OS:** SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default

**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 1.3.0 released Sep-2017

**File System:** xfs

**System State:** Run level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** Not Applicable

**Other:** None

### SPECrate2017_fp_base (45.3)

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<th>Rate</th>
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Dell Inc.

PowerEdge T440 (Intel Xeon Bronze 3104, 1.70 GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Oct-2017
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Results Table

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</tbody>
</table>

SPECrate2017_fp_base = 45.3
SPECrate2017_fp_peak = Not Run

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"

General Notes

Environment variables set by runcpu before the start of the run:

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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
SPEC CPU2017 Floating Point Rate Result

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PowerEdge T440 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECrater2017_fp_base = 45.3
SPECrater2017_fp_peak = Not Run

CPU2017 License: 55
Test Sponsor: Dell Inc.
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Tested by: Dell Inc.
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Platform Notes

BIOS settings:
Virtualization Technology Disabled
Sub NUMA Cluster Enabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C1E Disabled
C States set to Autonomous
Uncore Frequency set to Dynamic
Memory Patrol Scrub Disabled
Energy Efficiency Policy set to Performance
CPU Interconnect Bus Link Power Management Disabled
PCI ASPM L1 Link Power Management Disabled
Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bce91c0f
running on linux-hy8w Fri Oct 27 18:24:54 2017

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) Bronze 3104 CPU @ 1.70GHz
  2 "physical id"'s (chips)
  12 "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
physical 1: 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): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz
Stepping: 4
CPU MHz: 1696.014
```

(Continued on next page)
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Platform Notes (Continued)

BogoMIPS: 3392.02
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0,2,4,6,8,10
NUMA node1 CPU(s): 1,3,5,7,9,11
Flags: fpu vme de pse tsc msr pae mce 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 apic pu x2apic msr pefd tsc_cntHardware Availability: Sep-2017
Software Availability: Sep-2017

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

From /proc/cpuinfo cache data
cache size : 8448 KB

From /proc/meminfo
MemTotal: 196687624 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12

(Continued on next page)
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Platform Notes (Continued)

PATCHLEVEL = 2
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:
NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
Linux linux-hy8w 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 27 13:39

SPEC is set to: /root/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 260G 69G 192G 27% /

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 Dell Inc. 1.2.10 10/16/2017
Memory:
8x 002C04B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666, configured at 2133
4x 002C0632002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666, configured at 2133
4x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
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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**SPECrate2017_fp_base = 45.3**

**SPECrate2017_fp_peak = Not Run**

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**Compiler Version Notes (Continued)**

icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------

<table>
<thead>
<tr>
<th>C benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>icc</td>
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Base Compiler Invocation (Continued)

C++ benchmarks:  
 icpc

Fortran benchmarks:  
 ifort

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.cactusBSSN_r: -DSPEC_LP64  
508.namd_r: -DSPEC_LP64  
510.parest_r: -DSPEC_LP64  
511.povray_r: -DSPEC_LP64  
519.libm_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=3

C++ benchmarks:  
-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)

Fortran benchmarks:

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```

Benchmarks using both Fortran and C:

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```

Benchmarks using both C and C++:

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

Benchmarks using Fortran, C, and C++:

```bash
-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:

```bash
-m64 -std=c11
```

C++ benchmarks:

```bash
-m64
```

Fortran benchmarks:

```bash
-m64
```

Benchmarks using both Fortran and C:

```bash
-m64 -std=c11
```

Benchmarks using both C and C++:

```bash
-m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```bash
-m64 -std=c11
```

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:

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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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